HEALTH RISK APPRAISAL COUNSELING: EFFECT ON EMPLOYEE HEALTH BEHAVIORS, BELIEFS, AND LOCUS OF CONTROL

By

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TABLE OF CONTENTS

Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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This experimental study was conducted to examine the differential effects of health risk appraisal counseling on health behaviors, health beliefs, and health locus of control of university physical plant employees. Through stratified random sampling, 129 participants were selected and randomly assigned to one of three treatment conditions (printed information, group counseling, or individual counseling). There were two categories for each treatment type (white-collar and blue-collar) and three measurement occasions (pretest, posttest, and an eight-week follow-up).

The research design selected for this study was the Lindquist Type III (repeated measures) True Experimental Design. Split-plot analysis of variance was used to analyze the data. The independent variables were employee type and

treatment type. The dependent variables included measures of health behaviors (Health Risk Appraisal), health beliefs regarding susceptibility, efficacy, and self-efficacy (Health Beliefs Questionnaire), and health locus of control (Multidimensional Health Locus of Control Scales).

According to the results of the data analyses some statistically significant outcomes were found for each of the five variables. There was a significant main effect of time on health age, with the overall mean for health age decreasing. For the perceived susceptibility variable there was a significant main effect of time and a significant interaction between time and employee type at posttest and follow-up. There were three significant interactions for the perceived efficacy variable (time by employee type, time by treatment type, and time by employee type by treatment type). The results of the analyses indicated a significant main effect of time and employee type on self-efficacy. For the health locus of control variable there was a significant main effect of employee type and a significant interaction between time and treatment type.

Due to significant differences in employee type throughout this study, the most salient conclusion to be drawn is the need for differential treatment for white- and blue-collar employees. It was also recommended that follow-up be conducted sooner than eight weeks and that more than one counseling session be offered to participants.

CHAPTER 1

INTRODUCTION

Over the past 15 years the need for health promotion/wellness (HP/W) programming has become increasingly evident. During the 1970s the U.S. Public Health Service determined that improvement of the health of all Americans would not be achieved through medical treatment alone, but through health promotion and disease prevention efforts, particularly personal health behavior change (Califano, 1979). Consequently, some health professionals, educators, and counselors began to shift their emphasis to prevention. Assessments such as the Healthier People: Health Risk Appraisal (1988), which have been developed to apprise people of their health status and suggest lifestyle improvements, are finding their way not only into healthcare organizations, but also the workplace. The purpose of this study was to assess the effects of the HRA health counseling process on employee health behaviors, health beliefs, and health locus of control.

During the aforementioned time period, HP/W activities were designated as major health initiatives in several government documents: (a) The National Health Information

and Health Promotion Act (1976); (b) the Report of the HEW Departmental Task Force on Prevention (USDHEW, 1978); (c) the Surgeon General's Report entitled "Healthy People" (Califana, 1979); (d) "Promoting Health, Preventing Disease: Objectives for the Nation" (USDHHS, 1980); (e) "1990 Health Objectives for the Nation: A Midcourse Review" (USDHHS, 1986); and most recently, (f) "Healthy People 2000" (USDHHS, 1991).

In addition to governmental attention to HP/W, the medical, psychological, and business communities were also developing concepts of health and wellness. In his original work on HP/W, High Level Wellness, Halbert Dunn (1961) first conceptualized and defined wellness as "an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable; it requires that the individual maintain a continuum of balance of purposeful direction within the environment where he/she is functioning" (pp. 4-5, 1961). Dunn first presented these ideas emphasizing the interconnection of mind/body/spirit in a series of lectures at a Unitarian church in Washington, D.C., in the late 1950s. Although Dunn's ideas per se did not attract popular attention for some time, his concept of integrating body, mind, and spirit in order to achieve health (i.e., holistic health) was shared by others.

No longer limited to the physical realm, the definition of "health" was expanding to include many aspects of "being"

as well as environmental and social influences. As early as 1947, the World Health Organization defined health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease and infirmity" (World Health Organization, cited in Dunn, 1961, p. 1). In 1953 the President's Commission on Health stated that health is not a condition, but rather a process that adapts the individual not only to the physical, but also to the social environment. In his work, Man Adapting, Dubos (1965) defined health as an individual or group's ability to modify itself in order to function better in the present and the future by continually and effectively responding to a wide variety of environmental challenges.

Emphasizing personal choice and individual responsibility, Walsh (1988) conceptualized wellness as a series of daily living choices available to all, regardless of the presence or absence of disabling conditions. Apparently subscribing to Hettler's (1980) six-dimensional HP/W model, Walsh advocated paying attention to the physical, emotional, intellectual, social, spiritual, and occupational aspects of daily life while designing a lifestyle of well-being in order to reach optimum potential. Elias and Murphy (1986) asserted that HP/W "refers to all those activities that are aimed at apparently healthy individuals with the intent of helping them achieve maximum well-being" (p. 759).

Blanchard and Tager (1985) provided a definition less contingent upon personal responsibility and more specific to the workplace: "Health promotion programs are organized company-wide efforts that provide opportunities for employees to increase their knowledge of wellness and acquire the skills and support to translate this knowledge into lasting behavior change" (p. 34). Treborg (1986) emphasized organizational commitment as he stated that "worksite health promotion consists of an ongoing series of activities funded or endorsed by the organization that are designed to promote the adoption of personal behavior and corporate practices that are conducive to employee fitness, health and wellness" (p. 225).

In the early 1990s agreement has not yet been reached on a unified, commonly accepted definition of health promotion; but it is agreed that health promotion should be more than disease prevention, just as health should be more than the mere absence of disease (Walsh, 1988). While "yesterday's notion of health meant avoiding death, today it means attaining wellness" (Neufeld, 1984, p. 6). Today's notion of health has been largely influenced by Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention (Califano, 1979) which stated: "health promotion begins with people who are basically healthy, and seeks the development of community and individual measures

which can help them to develop lifestyles that can maintain and enhance the state of well-being" (p. 119).

Free from the burden of infectious diseases which accounted for the majority of deaths at the turn of the century, modern public health initiatives target diseases of adaptation, otherwise known as stress-related illnesses, which account for more than 65% of all deaths in the U.S. today. Because the top four killers, coronary heart disease, cancer, stroke, and accidents (U.S. Department of Health & Human Services, 1989), have their roots in lifestyle habits, they are amenable to prevention through changes in personal health behaviors.

In a report entitled "Promoting Health, Preventing Disease: Objectives for the Nation" (UDHHS, 1980) the U. S. Public Health Service published a set of national prevention objectives for each of the 15 priority areas identified in the (1979) Surgeon General's report. Although all the 1990 objectives had not been met, the year 2000 objectives (USDHHS, 1991) took an even more aggressive approach to health promotion by setting five broad national goals and expanding the number of priority areas to 21. The goals reflect an increased emphasis on reducing preventable morbidity and disability, decreasing the disparities between population groups, and improving quality, as well as quantity, of life. Of the 21 priorities, 10 mandate worksite programs as one means of implementation.

Concurring with this standpoint, a number of writers (Castillo-Salgado, 1984; Conrad, 1988; Fellows, 1988; Fielding, 1990; Masi, 1984; Naditch, 1985) have identified the worksite as an ideal setting for health promotion/ wellness activities. Castillo-Salgado (1984) pointed out that the workplace is an optimal setting for implementing HP/W efforts because more than half of the U.S. adult population (85 million people) spend about 30% of their time in the workforce where they are a well-defined and easily accessible population for service as well as research. Emphasizing the attractiveness of HP/W programs to employers and employees alike, Naditch (1985) suggested that the recent popular interest in jogging, fitness centers, health foods, and self-help makes employees more receptive to HP/W programs. Concurrently, the expectation of curbing health care, insurance, and retraining costs prompts more and more employers to consider implementing HP/W activities. In addition to these economic and personal considerations, the workplace offers "the opportunity to mobilize peer pressure to help employees make desirable changes in health habits" (Fielding & Piserchia, 1989, p. 16).

Unfortunately, the majority of employees do not take advantage of worksite HP/W. Hollander and Lengerman (1988) reported that although eligibility to participate in worksite HP/W activities is high (mean = 89%), actual participation rates are low (mean = 40%). They also

observed that programs typically lack careful planning and evaluation. Kronenfeld, Jackson, Davis, and Blair (1988) noted higher participation among white-collar workers and executives than among lower paid or blue-collar workers. According to Pauley, Palmer, Wright, and Pfeiffer (1982) many programs describe lower status employees, men, and older workers as those particularly hard to involve in HP/W activities. Demographic variables such as education, income, occupational status (white- or blue-collar), and gender influence HP/W participation. More educated, better paid, higher status, and female employees participate more than their less educated, lower paid, blue-collar, and male counterparts (Wilson, 1990).

Theoretical Framework

The main goal of employee HP/W programming is positive behavior change, which it is hoped will lead to changes in mediating mechanisms of health problems which will eventually affect changes in morbidity, mortality, and longevity (Ivancevich & Matteson, 1988). Such programs have the potential to improve employee health behaviors and promote healthy lifestyles by providing information and teaching skills to alter employees' negative health habits and to support positive ones. Many such programs utilize health risk assessment and communication (i.e., HRA), attitudinal measures (i.e., the Health Belief Model [Hochbaum, 1958; Rosenstock, 1966] and the Multidimensional

Health Locus of Control Scales [Wallston & Wallston, 1978]), and behavior change strategies that have their roots in social learning theory (Bandura, 1977b, Rotter, 1954).

Bandura's Social Learning Theory

Bandura rejected the notions that people are driven by inner forces (psychodynamic theory) or controlled by environmental stimuli (behavioral theory) in favor of an interactional view which he called "reciprocal determinism" (social learning theory). According to social learning theory, "psychological functioning is explained in terms of a continuous reciprocal interaction of personal and environmental determinants" (Bandura, 1977b pp. 11-12) with behavior and other personal factors, as well as environmental factors, operating as interlocking derterminants of each other. Learning and consequently, behavior take place as a result of symbolic, vicarious, and self-regulatory processes. Thus, health behavior change strategies must include information, modeling, and skill development mediated by self-referent thought (Bandura, 1982).

One of Bandura's (1977a, 1982) central concepts, self-efficacy--a proven predictor of psychosocial change--has implications for this study, particularly with respect to the Health Belief Model and Health Locus of Control. "Self-percepts of efficacy influence thought patterns, actions and emotional arousal . . . the higher the level of induced

self-efficacy, the higher the performance accomplishments and the lower the emotional arousal" (Bandura, 1982, p. 122). Self-efficacy expectations, learned from enactive attainment (personal experience), vicarious experience (role models), verbal persuasion (social pressure), and physiological state (somatic arousal), both mediate change and help maintain behavior change over time (Bandura, 1986). Therefore, individuals choose to engage in healthy behavior when they believe they can successfully perform the behavior required to produce the desired outcome and are convinced that the outcome will be beneficial (Sweeting, 1990).

In his more recent work, Bandura (1986) expanded the concepts of social learning theory into social cognitive theory. Human nature, in this view, rests upon a number of basic capabilities which drive behavior: (a) symbolizing capability; (b) forethought capability; (c) vicarious capability; (d) self-regulatory capability; and (e) self-reflective capability. Bandura applied these concepts to a wide range of human behavior including health behavior. He contended that when people believe they can master and adhere to health-promoting behavior, they are more likely to put forth the effort to succeed in such health areas as smoking cessation (DiClemente, Prochaska, & Gilbertini, 1985), substance abuse (Barrios & Niehaus, 1985), cardiac rehabilitation (Ewart, Taylor, Reese, and Debusk, 1983), physical stamina (Gould & Weiss, 1981), and others.

Consistent with the position of Marlatt and Gordon (1985) concerning the relapse process, when faced with minor setbacks or high-risk situations, individuals possessing a strong sense of self-efficacy are less likely to return to old habits (relapse) than those experiencing self-doubt. Goldfried and Robins (1982) pointed out that a critical condition for self-efficacy is that people attribute responsibility for behavior change to their own doing (internal locus of health control) rather than to outside forces (external locus of health control). Those who attribute changes in health or well-being to chance or powerful others are likely to be low on self-efficacy and more vulnerable to relapse when the external agents are withdrawn.

Health Belief Theory

Attempting to explain preventive (i.e., health-promoting) health behavior through U.S. Public Health Service research projects, Hochbaum, Leventhal, Kegeles, and Rosenstock formulated the Health Belief Model (Hochbaum, 1958; Rosenstock, 1966). This model is based on Lewin's (1935) field theory, a value-expectancy theory which explains human behavior in terms of two variables: the value placed by an individual on a particular outcome, and the person's estimate of the likelihood that a given behavior will result in that outcome (efficacy). According to the Health Belief Model, motivation to act in a health-promoting

manner is a function of the expectancy of attaining a health goal.

Maiman and Becker (1974) stated that the Health Belief Model is based on the following theoretical conditions and components: (a) readiness to undertake a particular health behavior depends upon both the individual's perceived susceptibility to disease or illness and the perceived severity of the consequences of contracting the illness; and (b) individuals evaluate health behaviors in terms of feasibility and efficaciousness (perceived reduction of susceptibility or severity) weighed against barriers or costs of the proposed action. Finally, a cue to action, either internal, external, or both, prompts the individual to initiate the appropriate health behavior.

The Health Belief Model provides a useful framework for examining the effects of communicating health risk information through the Health Risk Appraisal process. The HRA feedback itself increases perceived susceptibility by providing risk age and data on likely causes of death in the next ten years. It increases feasibility and efficacy by suggesting lifestyle changes to improve risk profile and achieve target age. The health counseling process, wherein the communication of HRA feedback takes place, helps to remove barriers including fear, lack of information, and lack of resources. It also provides cues to action that may

influence health beliefs and, consequently, health behaviors.

Locus of Control

The concept of locus of control grew out of social learning theory (Rotter, 1954). This theory employs four classes of variables: behaviors, expectancies, reinforcements, and psychological situations. The likelihood of a behavior occurring in a given psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement (positive or negative consequence) in that situation and the value of that reinforcement (Rotter, 1975).

Rotter's (1966) Internal-External Locus of Control (I-E) Scale was designed to study one variable in the social learning theory paradigm: the concept of internal versus external control of reinforcement of behavior. Individuals whose I-E score designates them "internals" believe that locus of control of reinforcement of behavior exists within themselves, whereas "externals" attribute control of reinforcement to forces outside themselves. Researchers originally thought that internal locus of control would increase the probability of taking positive health actions (Green, 1984b). However, due to limitations in measurement and problems with generality-specificity and unidimensionality-multidimensionality, the data supporting this contention were contradictory (Rotter, 1975).

Consequently, other researchers began to conceptualize locus of control scales more specific to their interest areas. Several health locus of control measures were developed for prediction of health-related behavior based on a unidimensional measure of people's belief that their health is or is not determined by their own behavior (Lau, 1982; Lau & Ware, 1981; Levenson, 1973; Wallston, Wallston, Kaplan, & Maides, 1976). Allowing for the multidimensional nature of health locus of control, Wallston and her associates continued to explore the relationship between locus of control and health-related behaviors. Subsequently, they developed the Multidimensional Health Locus of Control (MHLC) Scales (Wallston, Wallston, & DeVellis, 1978) which distinguish three dimensions: internality, powerful others, and chance.

Statement of the Problem

Although approximately 75% of the nation's 226 health objectives were expected to be achieved by 1990 (USDHHS, 1986), the general health status of Americans still leaves considerable room for improvement. Goals for the 1990s presented in Healthy People 2000 (USDHHS, 1991) target an increase in the span of healthy life for Americans, a reduction in health disparities between white and minority populations, and access to preventive services for all Americans. When presenting Healthy People 2000 for the first time, HHS Assistant Secretary for Health, James O.

Mason stated, "From the perspective of avoiding human suffering, as well as saving wasteful costs for treating diseases and injuries that could have been prevented, the 1990s should be the decade of prevention in the United States" (Healthy people 2000: A new agenda for health promotion and disease prevention across the nation, 1990, p. 2).

National goals notwithstanding, high-risk health behaviors continue to characterize American workers. Even though the most detrimental health behavior, smoking, accounts for approximately 390,000 deaths per year, nearly one-third of all adults in the U.S. continue to smoke (USDHHS, 1990). The prevalence of smoking behavior is disproportionately high among women, blacks, blue-collar workers, and people on the low end of the educational spectrum. Alcohol-related problems, high blood pressure, and human immunodeficiency virus affect a larger proportion of minorities, especially blacks, while overweight is particularly problematic for low-income and minority women. Additionally, mental, emotional, and behavioral disorders are approximately three times greater in the lower socioeconomic group than in the middle and upper socioeconomic levels (USDHHS, 1989).

A review of the current status of employee health promotion/wellness programs revealed that despite a preponderance of unhealthy behaviors, only a small

percentage of employees choose to participate in HP/W activities. Reports indicate that those who do participate are generally among the higher ranking (i.e., white-collar) employees. Unfortunately, there have been few rigorous evaluations of worksite HP/W programs (Murphy, Gasparotto, & Opatz, 1987; Nice & Woodruff, 1990; Warner, Wickizer, Wolfe, Schildroth, and Samuelson, 1988; Witherspoon, Bradley, & Wilson, 1990). In fact, data from a survey studying frequency of worksite HP/W activities (Fielding & Piserchia, 1989) indicated that almost 75% of the respondents' programs had no written goals or objectives, making evaluation very difficult.

Reporting on a study of gender differences in the health behaviors of white-collar corporate employees (180 men and 170 women) at AT&T, Spilman (1988) noted that additional research with very different populations is needed. She proposed that future research incorporating lifestyle risk factors should explore not only gender, but also social and economic classes in order to facilitate recruiting, retraining, and encouraging good health among all working men and women. Weitzel and Waller (1990) agreed that along with the general need for more research on health promotion, there is a special need for exploration of HP/W activities for persons from lower socioeconomic and varied ethnic groups. Their descriptive study, which compared HP/W behaviors of 173 white (n=90), black (n=35), and Hispanic

(n=48) blue-collar workers, led to the conclusion that there may be a need for differentiated intervention to improve the HP/W behaviors of these groups.

Health Risk Appraisal, one of the most widely used worksite HP/W program components (Fielding, 1982; Fielding & Piserchia, 1989; Smith, McKinlay, & McKinlay, 1989; Warner, et al, 1988), is intended to inform employees of the consequences of current health behaviors and thereby motivate change (Berlin, Thorington, McKinlay, & McKinlay, 1990). Although the structure and cost of HRAs are well known, their effectiveness in producing long-term behavior change is not (Warner et al., 1988). Various methods of disseminating HRA information have been used, but little is known about the relative impact of the various types of computer generated risk information. Also, the initial and long-term outcomes of various feedback formats and types and strengths of suggestions made to alter personal health behavior have not been fully explored (Fielding, 1982). The most effective method (i.e., printed information, group counseling, or individual counseling) of delivering HRA information has not been determined.

The relationship of health behaviors (revealed in the HRA questionnaire) to health beliefs and health locus of control has also not been investigated. Differences between white-collar and blue-collar workers in the same employment setting with respect to health behaviors, health beliefs,

and health locus of control have not been studied. Finally, distinctions between white-collar and blue-collar employees regarding effectiveness of treatment method (i.e., printed information, group counseling, or individual counseling) are unknown.

Need for the Study

If the differential effects of the HRA process (printout, individual, or group) on white-collar and blue-collar employees' health behaviors, health beliefs, and health locus of control were known, implications for theory, research, training, and practice in the area of HP/W could be construed. Such knowledge would encourage a critical look at the efficacy of theories underlying the HRA process and health behavior change. If no differences are found among treatment methods for either type of employee, then attention can be given to developing programs to address the identified needs (high-risk behaviors). If differences are found, then further attention can be paid to refining theories of behavior change for specific population groups.

Knowledge gained from this study can prompt further research into the impact of various methods of using the HRA process with diverse population groups. If no differences are found, then researchers can explore other reasons for disparities in HP/W participation rates among population groups. If differences are found, then researchers can

further investigate which interventions work best for which group under which conditions.

The results of this study will also increase the body of research findings regarding effectiveness of the HRA process in promoting employees' positive health behaviors by addressing some of the limitations that flawed previous studies. Berlin et al. (1990) mentioned the problem of missing or incorrectly specified responses, especially regarding physiological measures. Data for this study were collected at personal interviews. Actual measures of weight, height, and blood pressure were used. In addition, Weitzel and Waller (1990) indicated that most research conducted within the HP/W framework has focused primarily on white males from the upper and upper-middle classes. This study emphasized the needs of blue-collar workers, including non-whites of lower socioeconomic status. Other flaws pointed out by Wilson (1990) and addressed in the present study include lack of appropriate control groups, retrospective designs, convenience (rather than random) sampling, and over-reliance on self-report data. This prospective study used stratified random sampling, random assignment to groups, and actual measures of physiological data.

Given that one of the distinguishing characteristics of professional counseling is its proactive stance and commitment to prevention (Blocher, 1987), this study could

have implications for counselor training programs, especially those emphasizing health counseling. If no differences among groups are found, then counselor training can focus on the development of psychoeducational interventions and the application of individual and group counseling modalities to HP/W settings. If differences do exist, then training would need to be adjusted accordingly, emphasizing individual or group methods as indicated or perhaps focusing on multicultural counseling techniques.

For practitioners in worksite HP/W settings, this study could impact program planning and implementation. If no differences are found among treatments or groups (i.e., all methods explored produce positive health behavior change), then practitioners would be free to choose the methods best suited to their practice situations. If differences are found, then practitioners will have an efficacious model to follow. Finally if positive health behavior change does not occur at all, practitioners will need to explore new methods (other than HRA) of motivating health behavior change.

In summary, the results of this study provide valuable information that could advance theory, research, training and practice in the area of HP/W counseling. The application of learning theory to health behavior change will be tested, and the results should determine the direction for future research. Information gained from this

study will influence health counselor training and provide guidance for practitioners in worksite HP/W settings.

Purpose

The purpose of this study was to determine the differential effects of the health counseling process on employee health behaviors, health beliefs, and health locus of control. The goal of the treatment intervention, either printed information, group counseling, or individual counseling, was to bring about positive health behavior change as indicated by "appraised (risk) age" on the HRA.

A secondary purpose was to compare white- and blue-collar employees with respect to health behaviors, health beliefs, and health locus of control. The intent was to assess if job classification, either white- or blue-collar, is related to effectiveness of intervention. Specifically, the interactions between type of employee (white- or blue-collar) and type of treatment (printed information, group counseling, or individual counseling) were examined.

Rationale for the Approach to the Study

The need for positive health behavior change has already been well established (Blanchard & Tager, 1985; Fielding & Piserchia, 1989; Naditch, 1984; USDHHS, 1989, 1990, 1991) as has the efficacy of the workplace as a service delivery site for HP/W (Castillo-Salgado, 1984; Conrad, 1988; Everly, 1990; Fielding, 1990; USDHHS, 1988; Warner et al., 1988). Specifically, college and university

campuses have become increasingly involved in HP/W programming for their employees (Emmerling & Elsenrath, 1989; Hetherington & Loganbill, 1985; Marsh & Stockton, 1988; McMillen,1986; Sivik, 1989), and several descriptive studies have already been conducted (Barker, 1987; Sivik, 1989; Weitzel & Waller, 1990). Therefore, to determine the differential effects of the HRA health counseling process on the health behaviors, health beliefs, and health locus of control of university white- and blue-collar employees, an experimental study was designed.

Methods were chosen not only to control for possible threats to internal validity (Campbell & Stanley, 1966) and external validity (Bracht & Glass, 1968), but also to avoid some of the flaws noted in previous studies. A stratified random sample of physical plant employees (100 white- and 100 blue-collar) was invited to participate and was randomly assigned to groups (printed information, group counseling, or individual counseling). Participants included proportional numbers of blue- and white-collar workers and spanned all applicable socioeconomic levels. The variables studied were accurately described and measured. In particular, actual measures of some physiological variables called for in the HRA questionnaire (i.e., height, weight, blood pressure) were used, rather than self-report. Data were gathered through personal interview rather than pencil-and-paper participant tasks.

The measurement instruments were chosen for their sound construction and relevance to the study. The HRA was designed to assess the risk factors applicable to a person's health state while there is still time to modify some behaviors before health penalties occur. The health counseling format is a well-established method for giving HRA feedback to promote lifestyle change and increase life expectancy (Milsum, 1990). The health belief model is an empirically tested method of determining self-efficacy for health behavior change (Maiman & Becker, 1974; Maiman, Becker, Kirscht, Haefer & Drachman, 1977); and health locus of control has been demonstrated to be a predictor of success or failure in changing at least some health-related behaviors (O'Connel & Price, 1982; Segall & Wynd, 1990; Wallston & Wallston, 1978).

Definition of Terms

For the purpose of this study, the following terms were defined as indicated below:

Health behavior refers to the specific way individuals "act or respond that impacts on physical, mental, and spiritual well-being" (Girdano & Dusek, 1988, p.147). Positive, or preventive, health behavior includes activities undertaken by individuals to enhance or maintain health, both within and outside of the medical care system (Kirscht, 1983). Negative health behaviors are those which increase risk, as measured by the HRA (Appendix D).

Health beliefs are those notions held by individuals which influence readiness to take positive health action based on perceptions of susceptibility to and severity of disease or accident, the feasibility and efficaciousness of the recommended action weighed against barriers (Maiman & Becker, 1974), especially self-efficacy, as measured by the Health Belief Questionnaire (HBQ) (Appendix B).

Health locus of control refers to individuals' beliefs that control over their health resides internally, within themselves, or externally, with chance or powerful others as measured by Wallston and Wallston's (1978) Multidimensional Health Locus of Control (MHLC) (Appendix C).

Health risk appraisal (HRA) involves participants answering a series of health-related questions. Responses are entered into a computer using the Carter Center Health Risk Appraisal Program (1988). The HRA (Appendix D) yields a printout which indicates statistically and qualitatively based appraisals of the participant's health including "risk/appraised age" (risk of dying in the next 10 years), "target risk/achievable age" (hypothetical risk age which the participant might acquire by making habit, lifestyle or environmental changes), and suggestions to improve risk profile.

University physical plant employees are a group of 798 workers who are responsible for the operation, maintenance, and renovation of the educational buildings, utilities, and

grounds of the University of Florida. They are organized into nine departments:

1. The Work Management Center.
2. Energy Conservation.
3. Telecommunications.
4. Architecture/Engineering.
5. Administrative Services.
6. Maintenance.
7. Utilities.
8. Grounds.
9. Building Services.

Employee type (white- or blue-collar) was determined by job title.

In general white-collar employees are those workers whose jobs require higher levels of education, whose tasks are more mental than manual, and whose compensation is in the form of salary, rather than hourly wage (Wallace, Levens, & Singer, 1988). White-collar employees in this study come from all nine departments listed above.

In general blue-collar employees are those workers whose jobs may be designated skilled, semi-skilled, or unskilled labor, whose tasks are more manual than mental, and whose compensation is an hourly wage, rather than salary (Wallace, Levens, & Singer, 1988). The blue-collar employees in this study belong to the last four departments listed above. The organization itself (Physical Plant

Division) refers to these workers as "blue shirts." Supervisory personnel in these departments are known as "white shirts."

Organization of the Study

The remainder of this dissertation is organized into four chapters. In Chapter 2 the related literature is reviewed. Chapter 3 contains the research methodology, including a description of the population and sample, the sampling procedure, as well as data collection and analyses. The results of the study are presented in Chapter 4. Finally, in Chapter 5 the writer included a summary of the study, discussion of results, implications drawn from the research, and recommendations for further research.

CHAPTER 2

REVIEW OF THE LITERATURE

In Chapter 2, the professional literature relevant to employee health promotion and behavior change strategies is summarized and analyzed. This literature review encompasses the following topical areas: (a) employee health promotion/wellness programs; (b) health behavior and health behavior change; (c) health beliefs and health locus of control; and (d) Health Risk Appraisal. The chapter concludes with a summary of the literature review.

Employee Health Promotion/Wellness Programs

As competition in the American workplace increases, more employers are offering health promotion/wellness (HP/W) activities to help combat organizational and personal stress, improve productivity, and enhance health. The purpose of employee HP/W programs is to improve employee health behaviors and to promote healthy lifestyles by teaching skills to change negative health habits and to support positive ones. This purpose may be accomplished through individual behavior and/or lifestyle change or by changes in the practices and/or environment of the organization (Naditch, 1985). Some byproducts of improved

individual wellness may include an increase in job satisfaction and work performance and a decrease in tardiness, absenteeism, and on-the-job errors.

Prevalence

Roman's (1981) statement that prevention at the worksite is the wave of the future appears to be an accurate prediction. Fielding and Piserchia (1989) reported on the first National Survey of Worksite Health Promotion Activities which consisted of interviews with 1,358 (83% response rate) private sector employers. Of those worksites surveyed, 65% had one or more areas of HP/W activity, the majority of which had been instituted within the past five years. In most cases all company employees were eligible for program services, and the company absorbed most of the cost. "The percentage of blue-collar workers, male workers, workers less than age 30, and workers represented by a union did not affect probability of a worksite having one or more health promotion activities" (p. 17).

In a similar survey of Fortune 500 companies Hollander and Lengerman (1988) found that of the 247 companies that responded (49%), two-thirds (164) already had HP/W programs and two-thirds of them (108) intended to expand programming in the near future. One-third of the respondents without HP/W programs (28) planned to initiate them soon. Data from the survey were analyzed according to size of company, Fortune 500 rank, and type of industry (low- or high-

technology). In general higher ranked, larger, and high-technology companies offered more HP/W programming, utilized health professionals more often, and paid more attention to planning and evaluation. Overall, eligibility to participate in HP/W activities was high, but actual participation rates were low.

A similar, but less comprehensive, survey of university wellness/fitness programs revealed that relatively few institutions of higher education (as compared to over 50,000 corporate settings) were providing HP/W programs for their faculty, staff, or students (Marsh & Stockton, 1988). The survey questionnaire was sent to 106 institutions selected from a list identified by the National Wellness Association (NWA) and supplemented by others obtained from current journals. Of the 106 surveys sent out, only 41 (41.5%) were returned, with 33 (75%) of these indicating the existence of HP/W programs on their campuses. Although 97% of the programs were available to faculty and staff and 75% were available to students, in half of the cases less than 25% of faculty, staff, and/or students were participating.

Another survey with a similar target, four-year colleges and universities, was conducted by Sivik (1989). His sample (n=150) included institutions randomly selected from the Summer 1987 NWA Membership listing as well as all four-year institutions of higher education in Texas. Of the 72% (n=108) returning the survey, 74% reported the existence

of a designated HP/W program on their campuses, and 18% of those without programs were in the planning process. The majority of programs had been in existence less than five years. Some programs were available to faculty/staff only (24%) or students only (16%); however, considering joint programs, 82% were available to staff and 69% to students.

A third survey of HP/W at four-year public and private institutions, conducted during the 1985-86 school year, was co-sponsored by the American College Personnel Association, the National Wellness Institute (NWI), and Northern Illinois University. Of the 1,444 surveys mailed out, a total of 514 (36%) were returned. The returned surveys revealed that 283 (55%) had wellness programs established, 95 (18%) did not have HP/W programs but were planning to establish them, and 136 (26%) did not have and were not considering HP/W programs. Programs at 72% of the campuses responding had begun within the past four years. This report did not distinguish between programs for faculty/staff and programs for students. The researchers concluded that HP/W on university campuses is more than just a fad. They advocated integrating wellness theory with that of student development and applying wellness principles for students, faculty, and staff on a campus-wide basis (Emmerling & Elsenrath cited in Emmerling, 1989).

The high prevalence of employee HP/W programming (from 55% to 75%) reported in the surveys should not be regarded

as an accurate portrayal. Considering that response rates for three out of the four surveys were somewhat low (36%, 41%, and 49%), keeping in mind that companies and institutions that are involved in HP/W programming are more likely to respond to such surveys, and also allowing that two of the college/university surveys targeted NWI members, the percentages are probably inflated. In fact, in 1986 the NWI estimated that only about 20% of higher-education institutions already had HP/W programs in place. However, that number was expected to grow as more institutions began to realize that good health is good for business (McMillan, 1986).

Although the nonresponse factor may have inflated the results of the surveys, some conclusions can be drawn. A high interest in HP/W programming is evident. The relative newness of the concept and the fact that the majority of programs are less than five years old and have plans for future expansion indicate a potential for growth of the HP/W movement. Furthermore, the results appear to support Chenoweth's (1987) estimate that by 1995 over half of all U.S. employers will provide some type of employee HP/W program.

Need for Worksite HP/W

Considering the tremendous impact of physical and mental health problems on productivity and expenses in the workplace, the need is apparent for a comprehensive strategy

for implementing HP/W activities (Masi, 1984). Implementation of a "broad brush" approach to HP/W would help employers meet their goals of developing productive and competitive organizations and individuals, attracting high-performing employees, and enhancing the corporate image (Conrad, 1988). Other organizational benefits include improving employee morale, satisfying employee demands, joining an innovative trend (Davis, Jackson, Kronenfeld, & Blair, 1987), and especially reducing health-care costs (Elias & Murphy, 1986), increasing cost-saving potential (Warner, 1987), and decreasing employee disability, turnover, and premature deaths (Bellingham, Johnson, & McCauley, 1985).

In addition to the organizational benefits mentioned, a look at some statistics regarding employee health makes the need for HP/W activities even more evident. According to Blanchard and Tager (1985) "absenteeism, premature death and disability, lack of stamina and endurance have their roots in lifestyle habits" (p. 29). Because the lifestyle diseases/illnesses are directly related to negative health behaviors, they are nearly 100% preventable, simply by changing behavior. As Califano (1986) so succinctly stated, "Each of us can do more for our own health than any doctor, any hospital, any machine, or any drug" (p. 187).

To illustrate the connection between lifestyle habits and health problems, the Office of Disease Prevention and

Health Promotion (USHHS, 1988) compiled some startling statistics which demonstrate the need for worksite HP/W:

1. Smoking-related health problems cost U.S. businesses $26 billion per year in lost productivity and $7 to $8 billion in smoking-related medical costs.

2. Workers who smoke are 50% more likely to be hospitalized than nonsmokers, have twice as many job-related accidents as nonsmokers and have absenteeism rates approximately 50% higher than nonsmokers.

3. People who smoked an average of one or more packs of cigarettes per day had 118% higher medical expenses than nonsmokers.

4. There is a two-to-three-fold difference in cardiovascular deaths between active workers and their more sedentary counterparts.

5. Back problems result in the loss of 93 million workdays annually in the U.S.

6. The underexercised spent 114% more on health claims than those whose exercise was equivalent to walking one and one-half miles weekly or more.

7. One-third of the U.S. population is obese to the extent of decreasing their life expectancy, and healthcare costs for these people are about 11% higher than those for thin people.

8. Approximately 50% to 80% of physician visits can be attributed to stress-related or psychosomatic causes.

9. Motor vehicle accidents are the largest single cause of lost work time and on-the-job fatalities, accounting for 27% of all work-related deaths and 45 million lost workdays per year.

10. According to the Health Care Financing Administration, healthcare costs continue to spiral, having consumed 4.4% of the gross national product (GNP) in 1950, 10.5% in 1982, and an expected 12% in 1990 (Chenoweth, 1988).

Blanchard and Tager (1985) also noted costs related to unhealthy workers. Due to the physical and mental symptoms of work-related stress, they contended, nearly 12,000 workers filed worker's compensation claims in 1983 alone. Hypertension, one of the leading work-related stress illnesses cost employers a minimum of $870 per year for each hypertensive worker. Also, employees with drug and/or alcohol problems cost business and industry about $26 billion annually. Califano (1986) pointed out that, despite the astounding figures spent on the "sick care" industry, in 1984 less than one percent of the federal government's $112 billion health care budget was allocated for health promotion or disease prevention.

Efficacy of the Worksite

According to Brennan (1982), the worksite has unique potentials for effective HP/W programs that are distinct from similar programs in other settings. Because the

majority of employees spend nearly 30% of their time at the worksite, the convenience and accessibility of offering HP/W activities at the same location is an incentive for time-harried employees. It increases the potential for incorporating healthy activities into the daily routine by eliminating additional commuting time and travel costs, not to mention the psychological barrier of having to stop at yet another place. In addition, company sponsored programs can utilize both formal and informal communication networks to increase program visibility, mobilize peer pressure, and stimulate healthy competition.

Some practical benefits of worksite HP/W are listed by Blai (1985): (a) a supportive network, mutually beneficial to employers and employees, encourages workers in their efforts to stay well; (b) data connected with health insurance claims can be more easily collected and taken into consideration when modifying work operations and company policies; (c) individuals appreciate and respond to the convenience of on-site HP/W programs; and (d) the great amount of time spent at the workplace influences employees' social attitudes and habits; therefore, worksite HP/W improves employees' sense of well-being and morale.

Health Behavior and Health Behavior Change

The importance of positive health habits to good health is not a new idea (Kronenfeld, Jackson, Davis, & Blair, 1988), but recently there has been a resurgence of interest

in the role that individuals play in maintaining their own health (Green, 1984a). Experts in the medical, behavioral, and social sciences agree that lifestyle is the most important modifiable factor influencing health and illness today (Kronenfeld et al., 1988). Lifestyle has been defined as "the sum of decisions by individuals that affect their health and that can, to some extent, be controlled by them" (Lalonde, 1975, p. 2). Decisions that threaten health create self-imposed risks, while decisions that protect health foster wellness. Thereby, individuals contribute to their own illness or health.

In addition to personal choices about food, smoking, drinking, etc., lifestyle also has economic and cultural dimensions. There is overwhelming evidence to support the impact of socioeconomic factors on health: income, work, housing, physical and social environments not only have a direct effect on health, but also influence behavior (Blaxter, 1990). The wellness lifestyle is a dynamic style of living characterized by a continuous unfolding of human potential (Dunn, 1961). The wellness model intends to maximize good health (Ardell, 1977) in contrast to the illness approach of the medical model which seeks to minimize disease (Ivancevich & Matteson, 1988).

Health Behavior

A variety of terms (i.e., health behaviors, health habits, lifestyle habits) have been applied to actions taken

by people to enhance or maintain their own health. For the purpose of this study health behavior refers to the specific way individuals "act or respond that impacts on physical, mental, and spiritual well-being" (Girdano & Dusek, 1988). This concept has been derived from Kasl and Cobb's (1966) classic definition of "preventive health behavior," which included activities within the medical care system undertaken by healthy people for the prevention or early detection of disease. This idea was expanded by Harris and Gluten (1979) who used the term "health protective behavior" to include behaviors outside the medical care system believed to protect or enhance health.

Thus positive, or preventive, health behavior may be viewed in terms of the public health model of primary, secondary, and tertiary prevention. Several writers have attempted to differentiate among these three levels of prevention. Lewis and Lewis (1981) apply the public health terminology to mental health:

> Primary prevention . . . focuses on lowering the incidence of emotional problems and on promoting positive mental health among people not identified as having any special difficulty. It can be distinguished from secondary prevention, which aims toward early identification and prompt treatment of problems, and from tertiary prevention, which attempts to decrease the long-term effects of disabilities. (p. 173)

Bloom (1981) described prevention as a very familiar concept made vague and confusing through terminology. In his estimation, only "primary prevention" is "prevention." "Secondary prevention" is "treatment," and "tertiary

prevention" is "rehabilitation." Albee and Gulotta (1986) suggested using Loyd Rowland's terms "prevention," "early treatment," "treatment," and "rehabilitation" to clarify the broad repertoire of mental health activities sometimes combined under the umbrella term "prevention." They noted that most prevention practitioners focus on primary prevention, i.e., proactive programs aimed at groups of unaffected (well) people, planned for the purpose of reducing future incidence of disturbance or illness.

Primary prevention has been referred to as "an idea whose time has come" (Klein & Goldston, 1977, p. 77), "the fourth mental health revolution" (Albee, 1980, p. 67), and "the possible science" (Bloom, 1981, p. 1). Primary prevention behaviors identify and reinforce people's strengths as well as identify and remove pathogenic factors in people's physical and social environments (Walsh, 1988). Examples of this type of health behavior include wearing seatbelts, decreasing noise levels at worksites, attending stress management classes. Secondary prevention behaviors aim to reduce risks and curtail health problems in their early stages. Some examples are smoking cessation and reducing cholesterol intake. Tertiary prevention behaviors include adherence to treatment regimens such as exercising, reducing dietary fat, or taking medication to control blood pressure following a heart attack.

In contrast to positive health behavior which is preventative, negative, or high-risk, health behaviors jeopardize the achievement or maintenance of good health. Califano (1979) attributed the ten most frequent causes of death in the U.S. (i.e., heart disease, cancer, stroke, non-motor-vehicle accidents, infectious diseases, motor vehicle accidents, diabetes, cirrhosis of the liver, arteriosclerosis, and suicide) to high-risk behaviors. He believed a substantial reduction in at least seven of these ten causes could be achieved if at-risk persons improved five health habits: diet, smoking, lack of exercise, alcohol consumption, and use of hypertension medication.

Matarazzo (1984) also acknowledged the relationship between personal behavior and health. He referred to negative health behaviors as "behavioral pathogens" which he thought contributed just as much to illness and dysfunction as microbial pathogens. He suggested paying equal attention to positive health practices which he termed "behavioral immunogens."

Through their extensive survey research with a representative probability sample of 6,928 Americans, Belloc and Breslow (1972) discovered that seven specific personal health practices were highly correlated with physical health:

1. Sleeping seven to eight hours daily.
2. Eating breakfast almost every day.

3. Never or rarely eating between meals.
4. Currently being at or near ideal weight.
5. Never smoking cigarettes.
6. Moderate or no use of alcohol.
7. Regular physical activity.

Those who followed all or most of the seven healthy practices were found to be in better general health at the time of the original survey (1965) as well as at periodic follow-up analyses over the next nine and one-half years (Breslow & Enstrom, 1980).

In a similar study, Mechanic (1979) examined health practices of 350 mothers and their children in 1961, and resurveyed 333 of the children as adults in 1977. His "stability of response" correlations indicated that health-related attitude responses of the children (ages 9 to 12) were only modestly correlated with the answers given by the same children as adults 16 years later. The ten dimensions of health and illness behavior of the adult sample were also only modestly correlated with each other, and no single one or small number of combined dimensions was significantly related to personal responsibility for health. However, when eight of the health behaviors in question were combined into a single index of degree of positive health behavior, Mechanic and Cleary (1980) concluded that for adults, positive health behavior is a lifestyle indicator involving the individual's ability to anticipate potential health-

related problems, to meet the challenge they present, and to cope actively.

Reed (1983) examined physical health status by a set of selected lifestyle practices similar to those studied by Belloc and Breslow (1972). His sample was selected from a group of 3,300 suburban St. Louis employees and included 225 who joined the prepaid group health plan and 225 who did not. Data on 347 (77% response rate) were originally collected by a household interview, and follow-up surveys were done by mail.

Results of the survey were analyzed using "ridit" (Relative to an Identified Distribution) to obtain weighted values in each category (i.e. physical health indicators, age, race, and education). The data indicated that health is clearly a function of age, with each higher age group having relatively poorer health. Physical health is also a function of sex, as among women only those up to age 25 had better than average health, while men had relatively good health through age 45. The relationship between health and income was curvilinear, with poorer health status in the middle income categories; however, when age and sex were controlled, the relationship became more linear with poorer health at the low-income level. Education was positively associated with physical health; and, surprisingly, in this sample, nonwhites reported better physical health than the white respondents.

In conclusion, lifestyle habits, or health behaviors, are thought to be among the most salient factors influencing overall individual health. Health behavior may be either positive or negative. Behavior choices made daily by individuals either improve or harm health, and the effects of these choices are compounded by time. Although the influence of socioeconomic status, heredity, and gender cannot be ignored, all individuals can make choices to improve their quality of life and even their statistical life expectancy (Sizer, Whitney, & Cowley, 1988).

Health Behavior Change

Because lifestyle change to improve health is related to behavior modification and also to many other areas ranging from medical practice to personal relations, a holistic approach to behavior change is necessary to achieve maximum results (Milsum, 1990). Behavior change may be a self-initiated process, an outcome of health counseling, or the result of worksite health promotion/ wellness (HP/W) efforts. Research in health behavior change has resulted in the development of several models to explain the process.

Brown's (1976) hierarchical model involves five stages which can be applied to health behavior change: (a) awareness of risk, knowledge that the present behavior is harmful; (b) acceptance of the personal application of this knowledge of risk; (c) integration of knowledge into the personal self-image; (d) effort toward change including a

decision to modify behavior and a beginning effort; and (e) application of knowledge to actually change lifestyle habits.

Cognitive behavior therapy (Meichenbaum, 1977) has developed a systematic strategy for developing the coping skills to develop and maintain behavior change. The following six components have been successfully applied to a wide range of lifestyle changes including alcoholism, test and speech anxiety, pain, and others (Roskies & Lasurus, 1980):

1. Understand the cognitive aspects producing the problem.

2. Self-monitor for maladaptive self-statements and behaviors.

3. Perform problem solving skills including problem definition, coping strategies, anticipation of consequences, and evaluation of feedback.

4. Model and rehearse coping behaviors including positive self-statements, attention focusing, and positive self-evaluation.

5. Apply specific coping skills such as relaxation, assertiveness, and meditation.

6. Perform successively more difficult real-life behavioral assignments until the desired skill level has been achieved.

Green, Kreuter, Deeds, and Partridge (1980) offered the PRECEDE (Predisposing, Reinforcing, and Enabling Causes in Educational Diagnosis and Evaluation) model to explain stages of behavior change. Predisposing factors including values, attitudes, and knowledge provide motivation to initiate behavior. Next, enabling factors, including resources and learned skills are mobilized to enable the behavior to be performed. Finally, reinforcing factors, including the attitudes and behavior of significant others, will either positively or negatively reinforce the behavior.

In their work with addictive behaviors, Prochaska and DiClemente (1986) developed a comprehensive three-dimensional model integrating stages of change, processes of change, and levels of change. The four stages of change, precontemplation, contemplation, action, and maintenance, form a cyclical, rather than linear pattern due to relapse. A process of change refers to a type of activity initiated or experienced by an individual to modify affect, behavior, cognitions, or relationships. The ten processes identified not only in theoretical and empirical analysis of leading therapy systems (Prochaska & DiClemente, 1986), but also in retrospective, cross-sectional, and longitudinal studies of self-changers (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983) include

1. Consciousness raising.
2. Self-liberation.

3. Social liberation.
4. Counterconditioning.
5. Stimulus control.
6. Self-reevaluation.
7. Environmental reevaluation.
8. Contingency management.
9. Dramatic relief.
10. Helping relationships.

The third dimension of their transtheoretical change model is designed to address the complex nature of human behavior change and interrelated levels of human functioning. This levels-of-change dimension represents a hierarchical organization of five distinct but interrelated levels to be addressed in treatment: (a) symptom/ situational; (b) maladaptive cognitions; (c) current interpersonal conflicts; (d) family/systems conflicts; and (e) intrapersonal conflicts. It is usually most productive to begin at the symptom/situational level and progress to other levels as indicated. Although formulated to treat addictive disorders, this model is applicable to a wide range of health behaviors including smoking, alcohol consumption, unhealthy eating, and others.

Behavior modification attempts to apply the principles of behavioral science to health promotion by manipulating the relationships between behavior and environmental events so that desirable health behaviors increase and undesirable

ones decrease (Chesney, 1984). According to Bandura (1969), there are three requirements for effective reinforcement strategies: (a) the reinforcer must have incentive value; (b) the reinforcing events must be contingent on the desired behavior; and (c) the desired behavior must be elicited for it to be reinforced. The presence of a positive reinforcer increases the frequency of behavior. An event whose contingent withdrawal increases the rate of behavior is a negative reinforcer. In self-managed behavior change (Thoresen & Mahoney, 1974), individuals learn to control reinforcement contingencies and to fend off relapse through self-behavior analysis.

No one method of health behavior change has proved superior over all others. In fact, most have shown mixed success (Chesney, 1984). Bandura (1977b) explained this variability in therapeutic effectiveness through his theory of self-efficacy. Empirical tests of this theory (Bandura, Adams, & Beyer, 1977) confirmed that treatments are more effective when they provide information about personal efficacy, thus increasing self-efficacy. In this model, expectations of personal efficacy are derived from four sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Therefore, it appears that health behavior modification programs that incorporate elements for

increasing self-efficacy will be more successful in enhancing health and maintaining change over time.

Strecher, DeVellis, Becker, and Rosenstock (1986) reported on a series of studies that demonstrated the applicability of these principles to health behavior. Their data indicated that nonsmokers and former smokers who had successfully quit had higher levels of self-efficacy than smokers. Participants who successfully lost weight were higher in self-efficacy than those who failed to lose weight. Also, females with higher levels of self-efficacy were more likely to use contraceptives successfully. The length of time a person persists at a difficult behavior like losing weight or quitting smoking depends on the value of the expected outcome, perceived self-efficacy, and how much a failure would threaten self-esteem (Sweeting, 1990).

Health behavior change includes active and passive measures, both of which have important roles to play in the control of disease and injury (Williams, 1982) as well as in worksite HP/W. Passive approaches protect employees from health risks without any cooperation, action, or individual decision to change behavior. Some examples of passive approaches which may be instituted by companies are non-smoking policies, reducing fat in cafeteria foods, removing junk food machines; while others may include adherence to standards established by the Occupational Safety and Health Administration (OSHA) to protect employees. Active

approaches require employees to engage in behaviors that protect or optimize their health. Some examples include exercise, attending health educations sessions, participating in health screenings, using seatbelts. The most successful change programs utilize a mixed strategy involving the adoption of both active and passive measures.

Milsum (1984) noted that both active and passive strategies are necessary. However, he advised that passive strategies should be implemented within a context where individuals are increasingly encouraged to view their own health as primarily their own responsibility. Recognizing the problem of compliance in active strategies, he still maintained that full health can only result from activities generated primarily within the individual. In contrast to this, Green (1984a) noted that most health behavior change interventions have tended to emphasize the individual, sometimes at the expense of taking action on needed change in organizational, institutional, environmental, and economic conditions shaping behavior. Therefore, the most successful worksite HP/W programs will attend to organizational policies which protect the health, safety, and well-being of employees while providing them with opportunities for individual health behavior change and enhancement.

Health Beliefs and Health Locus of Control

In examining individuals health behaviors and designing strategies for effective and positive health behavior change, it is necessary to consider their health-related attitudes and the relationship of those attitudes to their behavior. Two widely recognized barometers of health attitudes are health beliefs and health locus of control.

Health Beliefs

The Health Belief Model (HBM) has been implemented for over twenty years in an attempt to explain health behavior. Becker (1974) presented the HBM in a special issue of Health Education Monographs. According to the HBM, healthy behavior is more likely to occur in the presence of the following conditions: (a) perceived susceptibility to threat of illness or harm; (b) perceived seriousness of the consequences of failure to act; (c) perceived benefits of taking preventive action; (d) perceived benefits outweigh barriers to action; (e) belief that action will be successful in achieving the desired outcome; and (f) one or more cues to initiate action and reinforce the contemplated behavior. Attention to these beliefs provides a basis for understanding health behavior and its modification.

Although much of the research on the HMB has been devoted to preventive health behavior (e.g. regular medical and dental check-ups, immunizations, pap tests, chest x-rays, etc.), it may also be applied to health promoting

behavior. HP/W activities can be designed to provide cues to action, i.e., advice or information-- often in the form of fear-arousal (Kirscht, 1974)--which serve to raise the individual's perception of risk, emphasize the belief that behavior change will reduce risk, and increase self-efficacy to initiate behavior change by reducing barriers to action.

In an early attempt to provide empirical support for the HBM, Maiman et al. (1977) presented data from a prospective study of mothers' adherence to a diet regimen prescribed for their obese children. The subjects, 199 predominantly low-income, black (93.3%) mothers of children (aged 19 months to 17 years, mean = 11.5 yrs.), were patients in an ambulatory pediatric clinic. The dependent variable was change in child's weight over a two-month period.

The results indicated that the HBM provided a useful framework for interpreting noncompliance with long-run therapies. The mother's perceptions of her child's vulnerability to illness and the seriousness of obesity, her belief in the efficacy of the diet regimen, and her belief that the diet was safe were all found to be substantially associated with subsequent weight loss by the child. In addition to the findings of this particular study, the researchers reported that item analysis of the indices used to measure health beliefs demonstrated that clear and different belief dimensions do exist.

Janz and Becker (1984) summarized the results of 46 HBM studies and included a critical review of 29 studies published in the ten-year period 1974-1984. The results of the summary provided substantial empirical support for the HBM in prospective as well as retrospective research. The most powerful dimension proved to be "perceived barriers." "Perceived susceptibility" and "perceived benefits" were both important overall, with the former more explanatory of preventive health behavior and the latter more highly associated with sick role behavior. "Perceived severity" was the weakest variable overall but was strongly related to sick role behavior.

Of the studies reviewed, one concerning screening behavior (King, 1982) and two involving risk-factor behaviors (Langlie, 1977; Weinberger, Greene, and Mamlin, 1981) are of interest. King (1982) examined the HBM as a predictor of participation in a high blood pressure screening program. Participants in this prospective study received a health belief questionnaire in the mail approximately four days after receiving an invitation from the doctor to attend a blood pressure screening. HBM data were collected from 73 attenders and 29 non-attenders. Data analysis revealed significant associations between attendance and both perceived susceptibility to high blood pressure and perceived benefits of screening. Costs/barriers to screening was also a significant predictor

of attendance. Although the studies limitations included a relatively small sample of noncompliers as well as the potential confounding effects of (a) the letter inviting subjects to participate in the screening and (b) previous blood pressure screenings, it supports the efficacy of the HBM within the context of King's larger model synthesizing HBM and attribution theory.

Langlie (1977) attempted to examine the influence of social network variables on preventive health behavior as well as the degree of consistency among an individual's preventive health behaviors and to assess the ability of the HBM to account for variations in these behaviors. A questionnaire was sent to a systematic random sample of adults in Rockford, IL with telephone and personal follow up yielding a response rate of 383 (62%). The questionnaire assessed perceived vulnerability to illness or accidents in the next year, perceived benefits, and perceived barriers/costs of engaging in preventive health behaviors. Langlie contended that her data supported her hypothesis that the greater the number of appropriate socio-psychological characteristics possessed the more likely the individual would be to engage in preventive health behavior. Although methodological limitations included retrospective design and unusual operationalization of some behaviors, both benefits and barriers had a positive, significant relationship to preventive health behavior.

Weinberger et al. (1981) interviewed 120 outpatients at a municipal teaching hospital to determine the usefulness of the HBM in discriminating different levels of smoking behavior. Participants, categorized as ex-smokers, moderate smokers (less than 11 cigarettes per day), or smokers, were asked about smoking behavior, risks, and personal susceptibility. Both susceptibility and severity were positively and significantly related to smoking behavior and these two discriminant functions were able to correctly classify 66% of the participants. Limitations included: (a) retrospective design; (b) restricted generalizability (typical respondent was "a 58-year-old black female who had smoked for 29 years"); and (c) evaluation of only two HBM dimensions.

Slenker, Price, Roberts, and Jurs (1984) examined the exercise behavior of 124 joggers and 96 nonexercisers. HBM variables accounted for 61% of the variance between groups. Items most highly correlated to the criterion variable of jogging versus nonexercising measured the barrier dimension of the HBM.

In addition to studies which examined the HBM directly, many researchers have focused on one particular dimension, i.e., self-efficacy. Self-efficacy refers to belief in the ability to perform specific behaviors and is related to outcome expectancies, i.e., beliefs that performing the behaviors results in desired ends. As noted in the previous

section, Stretcher et al. (1986) explored the relationship of self-efficacy and outcome expectations to various health behaviors including smoking, weight control, and contraceptive use.

Several researchers (Condiotte & Lichtenstein, 1981; DiClemente, 1981; McIntyre, Lichtenstein, & Mermelstein, 1983) have examined the viability of post-treatment self-efficacy measures to predict follow-up status for smoking behavior. In Vallis and Bucher's (1986) estimation, collectively, the data from the above-mentioned studies highlight the ability of self-efficacy to predict performance over long periods in the absence of systematic intervening variables. Attempting to replicate the predictive ability of changes in self-efficacy over treatment and also to examine whether self-efficacy predicts performance in the presence of systematic interventions, Vallis and Bucher (1986) studied the relationship between self-efficacy expectations and the training effects of skill-based and non-skill-based procedures for pain tolerance in 80 university women.

Following Kendall's (1983) recommendation, they assessed self-efficacy prior to, during, and after the intervention. They found that self-efficacy magnitude significantly predicted training effects for the nonskills group and that changes in self-efficacy magnitude significantly predicted training gains on the tolerance

measure for both skills groups. The researchers concluded that changes in efficacy over training can be used to predict outcome, and may be used as an indication of whether remediation or additional training is required.

Health Locus of Control

In addition to beliefs about health, another factor which influences an individual's decision to initiate health-promoting behavior is health locus of control. This construct measures the degree to which individuals attribute locus of control of reinforcement of behavior to themselves (internal locus of control) or to forces outside themselves (external locus of control). Wallston, Wallston, & DeVellis' (1978) Multidimensional Health Locus of Control Scales distinguish one internality designation (IHLC), and two externality designations, powerful others (PHLC) and chance (CHLC).

In their review of the literature on locus of control and health, Wallston and Wallston (1978) concluded that locus of control showed promise in predicting and explaining specific health-related behaviors. The six studies involving smoking behavior indicated that non-smokers and those who decreased or terminated their smoking behavior were more likely to be internals (those who believe that reinforcement is contingent upon their own behavior); whereas, those who smoked or failed in their efforts to stop were more likely to be externals (those who believe that

reinforcement is contingent upon outside forces such as chance or powerful others).

Research involving locus of control and birth control/ family planning showed mixed results. Two studies (MacDonald, 1970; Lundy, 1972) with college students indicated sexually active internals were more likely to use contraceptives than sexually active externals. Other studies (Fisch, 1974; Gough, 1973; Seeley, 1976) examining locus of control and contraceptive use and/or family planning which included married women failed to confirm the previous findings.

Studies of weight loss and locus of control have also met with mixed results. There was some indication that the orientation of the treatment program may effect the weight loss outcome. Wallston et al. (1976) found no significant differences in weight loss between internals and externals. However, internals in weight loss groups that were more internally oriented and self-directed were more successful in losing weight. Because subjects whose programs matched their locus of control were more satisfied with treatment, it was suggested individual orientation be taken into consideration in program design.

Wallston and Wallston (1978) concluded that there is evidence that the locus of control construct is predictive of health-related as well as sick-role behaviors, specifically information seeking, taking medication, diet

adherence, doctor's appointments, and smoking cessation. Although results of the research were inconsistent, they maintained that internals generally demonstrated more positive health behaviors. The researchers attributed the lack of consistent findings to measurement error or lack of attention to other related variables. It was suggested that programs should be tailored to the locus of control of participants. It was also recommended that internality training be instituted.

> The goal of such training programs should be to train responsible internals, people who will recognize the need to use a health professional as an appropriate resource, but who will also see that actions of their own (based on sound medical advice) will be necessary to obtain and maintain health. (p. 114)

Many more recent studies have applied the locus of control concept to various health behaviors. In most cases the locus of control variable is studied in conjunction with other health, psychological, and social variables. Saltzer (1978) examined locus of control and health value in a weight control study. The results of the study supported her hypothesis that internals would be more motivated by the personal health value of weight control and externals would be influenced more by social factors such as appearance. In their study of eating habits Hayes and Ross (1987) concluded that the combination of internal locus of control, concern for health as a value, and intent to follow a healthy diet predicted good eating habits.

Huckstadt's (1987) study of drinking behavior revealed a relationship between locus of control and alcoholism. Nonalcoholics scored highest on internal locus of control, followed by recovering alcoholics. Active alcoholics scored the lowest on the internal dimension. These findings supported the fact that the goal for most treatment for alcoholics is to help the individual gain greater control over life events (Sweeting, 1990).

Two studies (Botvin and McAlister, 1981; Chassin, 1984) identified external locus of control, among other variables, to be predictive of smoking behavior. Kaplan and Cowles (1978) used health locus of control to predict success at changing smoking behavior. As they had hypothesized, individuals with an internal locus of control and a high value of health were most successful in changing smoking behavior over the seven-week intervention period. However, after the training phase, health values became a better predictor of subsequent smoking behavior (relapse) than locus of control.

Health Risk Appraisal

The Health Risk Appraisal (HRA) questionnaire (Carter Center of Emory University, 1981, 1988) is a paper-and-pencil instrument designed to assess lifestyle habits and activities as they relate to overall health and fitness. Analyzed by computer, the assessment printout yields "health age," points out areas of concern as well as strengths, and

suggests areas for improving health behaviors in order to increase life expectancy.

The HRA process itself is purported to motivate the retention or adoption of health behavior (Hyner & Melby, 1985). Ideally, the HRA results should be communicated by a health promotion/wellness (HP/W) professional in an educational-counseling session including not only interpretation of the printout, but also recommendations for risk reduction and behavior change (Hall & Sheedy, 1980). Once the results are explained and discussed, the counseling moves toward establishing a contract for change with the understanding that the ultimate responsibility for undertaking health behavior change rests with the client (Milsum, 1990).

Risk factor assessments or inventories such as the HRA are the entry point, and often, the mainstay of worksite HP/W programs (Levy, 1986). With proper use the HRA can serve as a fulcrum upon which to balance both health assessment and behavior change strategies in worksite HP/W programs. It can also be used to identify health needs that are currently unsatisfied and to determine which educational program represents the best next step in satisfying identified needs (Terry, 1987).

Although originally designed as a risk reduction tool within clinical medicine (Robbins & Hall, 1970), the HRA has been most widely adopted in health education and promotion

programs outside the medical field, especially in worksites (Nice & Woodruff, 1989). Attesting to the wide use of HRA at the worksite, Fielding (1989) reported that 29.5% of all U.S. worksites have some type of HRA activity. Of companies with more than 750 employees, 66% have some type of on-site HRA activity. HRA has been one of the tools used by many companies to assess the effectiveness of their HP/W programs.

In a quasi-experimental design study Spilman, Goetz, Schultz, Bellingham, and Johnson (1986) examined the effects of AT&T's Total Life Concept HP/W program. The participants (54% response rate) were divided into three groups (a) HRA and health education; (b) HRA only; and (c) attention control. At one-year follow-up, the education group showed significantly greater improvements in blood pressure, cholesterol, Type A behavior, and weight than the HRA only group. Lack of pretest and demographic differences among groups precluded an assessment of the independent effects of the HRA.

In another study Nice and Woodruff (1989) examined the behavioral and sociodemographic factors associated with voluntary response to HRA and assessed the effect of HRA feedback on subsequent preventive health behaviors and risk taking behaviors. Subjects were 625 Navy personnel selected from participants in a Navy-wide longitudinal health promotion evaluation. The sample was comparable in

demographics to the overall Navy population. Respondents to the initial health survey, HRA, and one-year follow-up survey were matched with a control group who responded to the initial and follow-up questionnaire but did not receive the health risk appraisal. Research findings indicated (a) no significant differences between groups; (b) non-respondents were younger, less educated, and engaged in more high risk health behaviors than respondents; (c) the mailed HRA feedback was not effective in changing health behavior.

In an earlier study Rodnick (1982) tested the use of a health hazard appraisal and counseling session with 292 employees of the Optical Coating Laboratory, Inc. in California. The following changes in medical risk were reported at one-year follow-up: reduction in blood pressure, decrease in cholesterol level in middle-aged men, some smoking cessation, increased exercise, increased breast self-exam by women, decreased alcohol consumption by men, and increased seat belt use by men. Limitations in the study included improbable changes in risk appraisal answers from pretest to posttest and lack of control group. Subjectively, the program was judged to be very successful by participants as well as employer because it increased employee interest in health and fitness, and it was perceived as a valuable employee benefit.

Although HRA is widely used and much research has been conducted, DeFriese (1990) pointed out that there are a

number of aspects of the method which require additional study. As the body of knowledge about HRA and its behavioral impact increases and new advances in computer technology increase the qualitative aspects of HRA information, new directions for research will be indicated. Rather than focus on the technical aspects of risk estimation, future research can attend to its educational impact.

CHAPTER 3

METHODOLOGY

The differential effects of Health Risk Appraisal counseling on employee health behaviors, health beliefs, and health locus of control was investigated in this experimental study. The goal of the treatment intervention, either printout, group, or individual feedback, was to bring about positive health behavior change as indicated by "appraised (risk) age" on the HRA. In addition white- and blue-collar employees were compared with respect to health behaviors, three types of health beliefs, and health locus of control. The intent was to determine if job classification, and/or treatment method is related to the effectiveness of the treatment intervention.

Subjects

The 798 employees of the Physical Plant Division of the University of Florida in Gainesville, Florida were the population from which subjects were drawn for this study. In order to obtain a representative sample of white- and blue-collar workers, stratified random sampling was used to select participants. Originally, 100 employees in each of the two strata (white-collar and blue-collar) were invited

to participate. Of the 200 employees invited, 136 agreed to participate, and 129 participants (66 white- and 63 blue-collar) actually attended the first session . Approximately 45 subjects were randomly assigned to each of the three treatment conditions.

Design Schema

The Lindquist Type III (repeated measures) True Experimental Design (Huck, Cormier, & Bounds, 1974), as shown in Figure 3-1, was used in this study. The three groups were differentiated in the following way: (a) Group One received a printout of the results of the pretest; (b) Group Two received the printout in a group health counseling session; (c) Group Three received the printout in an individual health counseling session. The groups were proportionately divided between white-collar and blue-collar employees.

R	O1	X1	O2	O3
R	O1	X2	O2	O3
R	O1	X3	O2	O3

R = random assignment to treatment groups
O1 = pretest observations of health behaviors (HRA), health beliefs (HBI), and health locus of control (MHLC).
X1 = HRA printout given to Group 1 participants.
X2 = HRA printout delivered to Group 2 participants in group HRA feedback/counseling session.
X3 = HRA printout delivered to Group 3 participants in individual HRA feedback/counseling session.
O2 = Observation: HBI and MHLC
O3 = Observation: HRA, HBI, and MHLC

Figure 3-1. Lindquist Type III True Experimental Design.

Independent Variables

Two independent variables were utilized in this study. The first variable, type of employee, consists of two levels: blue-collar and white-collar. The second variable, type of treatment, consists of three levels: printout, group counseling, and individual counseling.

Dependent Variables and Instruments

The dependent variables included measures of health behaviors, three types of health beliefs, and health locus of control. Health behaviors were measured through the HRA (CDC, 1988). Health beliefs, based on Rosenstock's (1974) Health Belief Model were measured through the Health Belief Questionnaire (HBQ). Health locus of control was determined according to the Multidimensional Health Locus of Control (MHLC) Scales (Wallston et al., 1978).

Health Risk Appraisal

"Healthier People," the Carter Center of Emory University HRA, is a new probability-based adult health risk appraisal instrument developed in conjunction with the Center for Disease Control (CDC). This HRA provides a computer program and related materials that can be continuously updated and refined to keep pace with advancing knowledge and a growing data base. This approach employs a 45-item questionnaire which, when subjected to computer analysis, identifies precursors associated with premature death or serious illness and quantifies their probable

impact for the individual (Amler, Moriarty, & Hutchins, 1988).

To determine predictive validity, Foxman and Edington (1987) assessed the accuracy of the CDC HRA in predicting mortality by comparing observed to predicted mortality for the 3,135 persons followed from 1959-1979 as part of the Tecumseh Community Health Study. Observing both 10-year and 20-year mortality rates both by age-sex-race alone and also by all health variables (including age, sex, and race), they found that as the predicted mortality risk increased, so did the observed mortality for both prediction methods. Predicted mortality for the total sample (13.3%) compared quite accurately with the actual death rate (13.5%) at the 20-year follow-up.

Golaszewski, Vickery and Pfeiffer (1987) reported that in a comparable study by Smith, McKinlay, and Thorington (1986), HRA output (expressed as either mortality risk, morbidity risk, heart disease risk, life expectancy, or general health status) was correlated with a composite mortality coefficient estimate from the Framingham Study and the Risk Factor Update Project. The overall correlation for LifeScore Plus, a health risk instrument derived from the CDC HRA, was .759.

Berlin and Edington (1982, 1983, cited in Golaszewski, Vickery, & Pfeiffer, 1987) attempted to establish the face validity of the HRA. In one study they correlated six

selected HRA responses with several established scales in a population of 200. There was a high degree of association between the questions of interest and their parallel multiple-item scales. Another study, using biomedical tests to validate self-reported measures of health and lifestyle habits (e.g. exercise habits) in a sample of 100 university staff and faculty, also showed a high degree of association between self-report responses and actual physiological measures. Therefore, the researchers concluded that the HRA items studied appeared to be measuring what they were intended to measure.

Contrary to this conclusion, Smith, McKinlay, and McKinlay (1989) reported that Best and Milsum (1978) found improbable changes in body frame size, medical and family history when the HRA was repeated after six months. Also, Sacks, Krushaf, and Newman (1980) found only 15% of subjects in their clinical study gave consistent responses to all HRA items at baseline and follow-up. Methodological limitations in these studies included limited samples, use of volunteers, inattention to actual behavior changes, and lack of clarity regarding the effect of the length of the follow-up period on HRA scores, and made it difficult to generalize about HRA reliability (Smith et al., 1989).

Attending to these limitations, Smith et al. (1989) investigated the reliability of four HRA instruments. The HRAs were administered to 338 randomly selected adults aged

25 to 65 years on two occasions 7 to 12 weeks apart. Reliability analyses were conducted by comparing the baseline scores for individual risk items, heart attack risk, and appraised age with the values chosen by the same respondent at follow-up. Test-retest correlations were computed for selected items only for those respondents who claimed their behavior had not changed during the follow-up period. For the CDC HRA test-retest correlation coefficients were reported to be .75 for family history, .95 for smoking, .96 for weight, .65 for physical activity, and .84 for heart attack risk scores and appraised age.

A study of Travelers' employees by Golaszewski et al. (1987) supported the test-retest reliability of the HRA. The LifeScore Plus HRA was distributed to all Travelers' employees. Without any ensuing intervention, 100 employees were randomly selected to repeat the HRA one month later. With respect to the primary analyses of the 97 variables measured, all had significant correlation coefficients ranging from 1.00 to .37 ($p < .05$). The correlations for group appraised age, achievable age, deaths/100,000 for heart disease were all .99. Therefore, the researchers concluded that the HRA yields consistent group summary statistics over repeated measures, making the HRA a useful pre-intervention, post-intervention evaluation tool, especially when group summary statistics are the variables of interest.

Health Belief Questionnaire

The HBQ is a two-section instrument developed by Stiles (1987) to assess the three dimensions of the Health Belief Model: (a) threat (i.e., perceived susceptibility to and severity of illness or accidents); (b) benefits (i.e., perceived efficacy of positive health behaviors to reduce risks); and (c) barriers (i.e., perceived barriers to performing positive health behaviors, specifically self-efficacy). Section I, a modified version of Cioffi's (1980) questionnaire, uses a five-point Likert scale to assess threat and benefits. Section II, based on Bandura's (1977) concept of self-efficacy, uses a scale ranging from 0% to 100% to assess the strength of self-efficacy for performing 14 specific health behaviors.

Based on a pilot test of her instrument, Stiles (1987) reported internal consistency reliability coefficients for the perceived susceptibility and perceived efficacy of prevention indices to be .87 and .85 respectively. Test-retest reliability coefficients were determined to be .82 for specific and .87 for general susceptibility. The test-retest reliability coefficient was .75 for items measuring prevention of specific illness or accident and .72 for items measuring specific actions for prevention of illness. Pilot testing on the self-efficacy scale yielded a moderate test-retest reliability of .56.

Multidimensional Health Locus of Control Scales

The original Health Locus of Control Scale (HLC) developed by Wallston et al. (1976) consisted of 11 items designed to assess the degree to which individuals attribute their health status to their own behavior. High total scores on the HLC external dimension indicated the belief that health is determined by factors over which individuals have little control (i.e., fate, chance, powerful others), while the internal dimension indicated a belief that personal health is attributable to personal behavior. Further exploration of this variable led to the development of the MHLC (Wallston & Wallston, 1978) Scales using Levinson's (1974) dimensions of Internal (I), Powerful Others (P), and Chance (C).

Beginning with the HLC original 11 items, 76 new items were written which, on an a priori basis, reflected the three dimensions: internality (IHLC), powerful others (PHLC), and chance (CHLC). In booklet format the 76 HLC items were mixed with Levinson's I, P and C scale items, a shortened 10-item version of the Marlon-Crown Social Desirability Scale and two items measuring perceived health status. All items utilized a 6-point Likert scale. Persons over 16 years of age who were waiting at gates at a metropolitan airport were asked to participate by filling out and returning the questionnaires. Of the 125 subjects

returning the booklets, 49% were males, 79% had some college education, and the mean age was 42.

Separate item analyses were run on the questions using the following criteria: (a) item mean close to 3.5, the midpoint; (b) wide distribution of response alternatives on the item; (c) significant item to a priori scale correlation; (d) low correlation with the measure of social desirability; (e) item wording. Based on this criteria, six pairs of items were chosen for each of the new scales. To construct the equivalent forms of each scale, items within each pair were assigned to form A and B so that the total scores (six items each) were as identical as possible.

Alpha reliabilities for the MHLC scale ranged from .673 to .767 for each form, and increased to .830 to .859 when the forms were combined. The mean scores of form A and B were nearly identical. Intercorrelational matrix scores showed that the IHLC and PHLC scales were statistically independent. The IHLC and CHLC were negatively correlated and the PHLC and the CHLC were positively correlated. There was a small negative correlation between the CHLC total and social desirability. Low positive correlations with appropriate I, P, and C scales (Levinson, 1974) represented construct validity. Correlations in the predicted direction of the MHLC scales with health status provided evidence of predictive validity.

Data Collection

Pretest data were collected by the researcher in individual interviews with the study participants. Permission was granted for the researcher to meet with participants in one of the department buildings to collect data. The interview approach eliminated errors or lack of participation due to limited reading ability on the part of some employees. Actual measures of physiological data were collected at the time of the interviews.

Once the pretest measures were taken and the HRA computer-generated reports were available, treatment sessions were scheduled. Group One (printout) subjects were scheduled for a group meeting. They were given their printout and allowed 15 minutes to review it. Then the HBQ and MHLC (posttest) were administered. Participants were not given any verbal feedback about their HRA printouts; nor were they asked to commit to any health behavior change strategy.

Group Two (group feedback/counseling session) subjects came to a group meeting where they were given their HRA printout and allowed 15 minutes to review it. Then the HRA printout was explained using a standardized (overhead projector format) "Health Risk Appraisal Consultation Flip Chart" (Benson, 1990) developed by the Health Education Division of the Hillsborough County (FL) Health Department. Sufficient time was allowed for questions and answers. Then

participants were asked to commit to a particular health behavior change of their own choosing over the next eight weeks. Finally, the HBQ and MHLC (posttest) were administered.

Group Three (individual feedback/counseling session) came to an individual counseling session. They were given their HRA printouts and allowed 15 minutes to review it. Then the HRA printout was explained using the standardized "Health Risk Appraisal Consultation Flip Chart" (Benson, 1990). Sufficient time was allowed for questions and answers. Then each participant was asked to commit to a particular health behavior change of their own choosing over the next eight weeks. Finally, the HBQ and MHLC (posttest) were administered.

Feedback/counseling treatment sessions were conducted by the researcher. A sampling of feedback/counseling sessions were audio-taped to ensure standardization. Eight weeks following the treatment sessions, follow-up sessions were scheduled. Follow-up data were collected according to the protocols established for pretest data collection. However, to control for "experimenter effect" (Rosenthal, 1966), follow-up data were collected by an independent third party having been trained by the researcher.

Data Analysis

Split-plot factorial analysis of variance (Lindquist Type III ANOVA) was used to analyze the data in this study.

The 3x2x3 factorial design utilized in this study is shown in Figure 3-2.

Treatment Method	Employee Type	Ss	Time of Observation: Pretest	Posttest	Follow-up
X1 (Printout)	White-Collar	S1 to S22			
	Blue-Collar	S23 to S42			
X2 (Group)	White-Collar	S43 to S64			
	Blue-Collar	S65 to S87			
X3 (Individual)	White-Collar	S88 to S109			
	Blue-Collar	S110 to S129			

Figure 3-2. Experimental 3 x 2 x 3 factorial design.

The split-plot ANOVA was run five times, once for each dependent variable: (a) health age, (b) health beliefs regarding perceived susceptibility to disease, (c) health beliefs regarding perceived efficacy of positive health behaviors for preventing disease, (d) health beliefs regarding self-efficacy for performing positive health behaviors, and (e) health locus of control. These factorial ANOVAs were performed to determine main effects of the independent variables [type of employee (white- and blue-

collar), type of treatment (printout, group, and individual), and time of administration of instruments] on health age, the three health beliefs, and health locus of control . The following interaction effects were also analyzed: (a) employee type by treatment type; (b) time by employee type; (c) time by treatment type; and (d) time by employee type by treatment type. Where significant interactions were found appropriate follow-up analyses were performed.

Hypotheses

Employee scores on repeated measures of the HRA, HBQ, and MHLC were evaluated as a function of type of employee and type of treatment. The following null hypotheses were investigated:

HO1: There is no significant difference in scores on the HRA (when all HRA scores for white- and blue-collar employees are combined and averaged across occasions) between the three treatment methods employed.

HO2: There is no significant difference in scores on the HRA (when all HRA scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

HO3: There is no significant difference in HRA scores for all employees between pretest and follow-up.

HO4:There is no interaction effect for HRA scores between treatment method and time of administration of the HRA.

HO5: There is no interaction effect for HRA scores between type of employee and time of administration of the HRA.

HO6: There is no interaction effect for HRA scores between type of employee and type of treatment.

HO7: There is no interaction effect for HRA scores between type of treatment, type of employee, and time of administration of the HRA.

There were parallel hypotheses and analyses for the additional dependent variables: (a) health beliefs regarding perceived susceptibility to disease, (b) health beliefs regarding perceived efficacy of positive health behaviors for preventing disease, (c) health beliefs regarding self-efficacy for performing positive health behaviors, and (d) health locus of control.

Limitations of the Study

This study was designed to control for threats to internal validity and external validity through stratified random sampling, random assignment to treatment conditions, and standardized treatment procedures. The only threat to internal validity not controlled by this research design was participant mortality. Because dropout rates were minimal

(14 out of 129) and were evenly distributed among groups, they did not significantly effect the outcome of the study.

Ecological validity may have been threatened in terms of accurate measurement of the dependent variables. Although actual physiological measures were used for the HRA, the behavioral measures of the HRA as well as the HBQ and MHLC items are subject to self-report bias. Subjects were randomly selected to participate, but participation in the study was voluntary. Therefore, self-selection bias was a consideration.

Because the research was conducted at the worksite, during work hours, the novelty and disruption effect may have been a factor; however, all participants should have been affected equally. Characteristics of subjects, treatment methods used, and characteristics of researchers were possible threats for which specific controls could not established. However, the methodology was constructed so as to limit the impact of other factors which could have influenced the results of the study.

CHAPTER 4

RESULTS AND DATA ANALYSIS

The purpose of this study was to explore the effects of health counseling (either group or individual) on health behavior (as measured by health age on the Healthier People Health Risk Appraisal), three types of health beliefs (as measured by the Health Beliefs Questionnaire), and health locus of control (as measured by the Multidimensional Health Locus of Control Scales) on white- and blue-collar employees. Five sets of null hypotheses were proposed to examine the effects of Health Risk Appraisal counseling on: (a) health age; (b) health beliefs regarding susceptibility, (c) health beliefs regarding efficacy, (d) health beliefs regarding self-efficacy; and (e) health locus of control. There were three treatment methods (printout, group counseling, and individual counseling) with two employee categories for each (white-collar and blue-collar) and three measurement occasions (pretest, posttest, and eight-week follow-up).

Presentation of Results

Split-plot analysis of variance (ANOVA) was used to test the hypotheses stated in Chapter III. Each set of

hypotheses was written to test main effects for occasion (TIME), treatment method (TX), and employee type (COL). Each was also written to test for the following interaction effects: (a) employee type by treatment type (COL X TX); (b) measurement occasion by employee type (TIME X COL); (c) measurement occasion by treatment type (TIME X TX); and (d) measurement occasion by employee type by treatment type (TIME X COL X TX).

The results of the data analyses are contained in this chapter. A table of means as well as source tables of the ANOVAs are included for each set of hypotheses. The results of the split-plot ANOVAs are discussed on an hypothesis-by-hypothesis basis.

Health Risk Appraisal

To test the hypotheses related to health age, a split-plot ANOVA was used. Health age was the one variable that was measured on only two occasions, pretest and follow-up. There was no posttest measurement because the treatment was not expected to have an immediate effect on health age. The table of means presented in Table 4-1 shows the means for chronological age for each group at pretest as well as the means for health age at pretest and follow-up. The source table detailing the statistical tests of the split-plot ANOVA follows in Table 4-2.

Table 4-1.

Means for Health Age and Chronological Age.

Treatment Method	Employee Type	N	Time of Observation: Pretest Health Age	Pretest Chron. Age	Follow-up Health Age
Printout	White-Collar	22	44.49	43.36	44.61
	Blue-Collar	20	42.11	41.30	41.41
Group	White-Collar	22	40.02	40.09	38.65
	Blue-Collar	23	39.42	38.22	39.45
Individual	White-Collar	22	44.89	45.68	44.99
	Blue-Collar	20	40.83	38.10	39.39

Table 4-2.

Source Table of ANOVA of Health Age.

Source	DF	SS	MS	F
Between Subjects				
COL	1	3485101.90	3485101.90	1.54
TX	2	7539588.20	3769794.10	1.67
COL X TX	2	3706670.50	1853335.20	0.82
Error Between	109	246695624.80	2263262.06	
Within Subjects				
TIME	1	329568.55	329568.55	21.74*
TIME X COL	1	24036.46	24036.46	1.59
TIME X TX	2	17550.43	8775.22	0.58
TIMExTXxCOL	2	19950.14	9975.07	0.66
Error Within	109	1652660.56	15162.02	

*$p < .01$

HO1a: There is no significant difference in health age scores on the HRA (when all HRA scores for white- and

blue-collar employees are combined and averaged across occasions) between the three treatment methods used.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of treatment on health age (F = 1.67, p = 0.1938 > .05).

HO1b: There is no significant difference in scores on the HRA (when all HRA scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of employee type on health age (F = 1.54, p = 0.2173 > .05.).

HO1c: There is no significant difference in scores on the HRA for all employees between pretest and follow-up measures.

These data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant main effect of time on health age (F = 21.74, p = 0.0001 < .01.). This analysis indicated that there was a general trend to reduce health age across measurement occasions for all groups. The overall mean for health age was lower at follow-up (41.42)

than at pretest (41.95), indicating improvements in health behavior which increased life expectancy by 0.53 years.

HO1d: There is no interaction effect for HRA scores between treatment method and time of administration.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment method and time ($F = 0.58$, $p = 0.5623 > .05$ with Huynh-Feldt adjustment).

HO1e: There is no interaction effect for HRA scores between type of employee and time of administration of the HRA.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between type of employee and time ($F = 1.59$, $p = 0.2107 > .05$).

HO1f: There is no interaction effect for HRA scores between type of employee and type of treatment.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between employee type and treatment method ($F = 0.82$, $p = 0.4436 > .05$).

HO1g: There is no interaction effect for HRA scores between type of treatment, type of employee, and time of administration of the HRA.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was

no significant interaction between treatment method, employee type, and time ($F = 0.66$, $p = 0.5200 > .05$).

Health Beliefs Regarding Susceptibility

To test the hypotheses related to health beliefs regarding perceived susceptibility to disease a split-plot ANOVA was conducted. Susceptibility was measured on three occasions. Table 4-3 shows the means for susceptibility scores at pretest, posttest, and follow-up. The source table detailing the statistical tests of the split-plot ANOVA follows in Table 4-4.

HO2a: There is no significant difference in scores on the susceptibility measure of the HBQ (when all susceptibility scores for white- and blue-collar employees are combined and averaged across occasions) between the three treatment methods employed.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of treatment on susceptibility ($F = 2.25$, $p = 0.1103 > .05$).

HO2b: There is no significant difference in scores on the susceptibility measure of the HBQ (when all susceptibility scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

Table 4-3.

Means for Perceived Susceptibility.

Treatment Method	Employee Type	N	Time of Observation Pretest	Posttest	Follow-up
Printout	White-Collar	22	24.59	24.50	22.50
	Blue-Collar	20	25.90	29.00	24.50
Group	White-Collar	22	22.82	22.43	22.26
	Blue-Collar	23	18.97	24.68	22.67
Individual	White-Collar	22	23.18	23.00	21.05
	Blue-Collar	20	23.35	28.79	24.56

Table 4-4.

Source Table of ANOVA of Perceived Susceptibility.

Source	DF	SS	MS	F
Between Subjects				
COL	1	307.16	307.16	3.79
TX	2	364.99	182.50	2.25
COL X TX	2	204.30	102.15	1.26
Error Between	109	8843.05	81.13	
Within Subjects				
TIME	2	440.24	220.12	10.64*
TIME X COL	2	285.09	142.54	6.90*
TIME X TX	4	80.08	20.02	0.97
TIMExTXxCOL	4	41.52	10.38	0.50
Error Within	218	4509.88	20.69	

*$p < .01$

Null hypothesis HO2b could not be rejected because according to the results of the split-plot ANOVA, there was

no significant main effect of employee type on susceptibility ($F = 3.79$, $p = 0.0543 > .05$).

HO2c: There is no significant difference in scores on the susceptibility measure of the HBQ for all employees between pretest, posttest, and follow-up measures.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant main effect of time on susceptibility ($F = 10.64$, $p = 0.0001 < .01$ with Huynh-Feldt adjustment). The significant difference occurred between pretest and posttest. The overall mean increased more than two points from pretest (23.22) to posttest (25.31), and leveled off at follow-up (22.89).

HO2d: There is no interaction effect for susceptibility scores between treatment method and time of administration of the susceptibility measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment method and time ($F = 0.97$, $p = 0.4217 > .05$ with Huynh-Feldt adjustment).

HO2e: There is no interaction effect for susceptibility between type of employee and time of administration of the susceptibility measure of the HBQ.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant interaction between time and employee type on susceptibility (F = 6.89, p = 0.0017 < .01 with Huynh-Feldt adjustment). This analysis indicated that the time of administration of the susceptibility measure had a differential effect on the two employee types. Follow-up analysis using the Dunn correction indicated significant differences at posttest (F = 25.05) and at follow-up (F = 5.56) with blue-collar means being greater on both occasions. No significant differences were found at pretest (F = .66). Figure 4-1 presents a visual graph of the data.

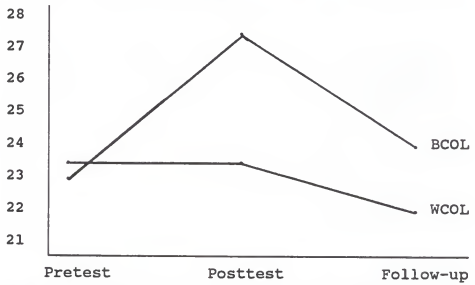

Figure 4-1. Perceived susceptibility means for two employee types: White collar (WCOL) and blue collar (BCOL).

HO2f:There is no interaction effect for susceptibility between type of employee and type of treatment.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was

no significant interaction between treatment type and employee type ($F = 1.26$, $p = 0.2880 > .05$).

HO2g:There is no interaction effect for susceptibility between type of treatment, type of employee, and time of administration of the susceptibility measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment method, employee type, and time ($F = 0.50$, $p = 0.7094 > .05$ with Huynh-Feldt adjustment).

Health Beliefs Regarding Efficacy

To test the hypotheses related to health beliefs regarding perceived efficacy for preventing disease a split-plot ANOVA was used. Efficacy was measured on three occasions. Table 4-5 shows the means for the efficacy scores at pretest, posttest, and follow-up. The source table detailing the statistical tests of the split-plot ANOVA follows in Table 4-6.

HO3a: There is no significant difference in scores on the efficacy measure of the HBQ (when all efficacy scores for white- and blue-collar employees are combined and averaged across occasions) between the three feedback methods employed.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was

no significant main effect of treatment on efficacy (F = 0.22, p = 0.1687 > .05).

Table 4-5.

Means for Health Beliefs Regarding Efficacy.

Treatment Method	Employee Type	N	Time of Observation Pretest	Posttest	Follow-up
Printout	White-Collar	22	94.77	93.64	88.8
	Blue-Collar	20	93.00	93.63	91.06
Group	White-Collar	22	88.36	88.90	91.11
	Blue-Collar	23	94.57	87.91	90.10
Individual	White-Collar	22	92.64	98.63	91.53
	Blue-Collar	20	94.55	92.58	96.89

Table 4-6.

Source Table of ANOVA of Health Beliefs Regarding Efficacy.

Source	DF	SS	MS	F
Between Subjects				
COL	1	56.90	56.90	0.22
TX	2	923.60	461.80	1.81
COL X TX	2	63.29	31.65	0.12
Error Between	109	27825.43	255.28	
Within Subjects				
TIME	2	192.08	96.04	1.41
TIME X COL	2	472.09	236.05	3.46*
TIME X TX	4	683.08	170.77	2.50*
TIMExTXxCOL	4	839.41	209.85	3.07*
Error Within	218	14893.47	68.32	

*p < .05

HO3b: There is no significant difference in scores on the efficacy measure of the HBQ (when all efficacy scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

H03b could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of employee type on efficacy ($F = 0.22$, $p = 0.1687 > .05$).

HO3c: There is no significant difference in scores on the efficacy measure of the HBQ for all employees between pretest, posttest, and follow-up measures.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of time on efficacy ($F = 1.41$, $p = 0.2474 > .05$ with Huynh-Feldt adjustment).

HO3d: There is no interaction effect for efficacy scores between treatment method and time of administration of the efficacy measure of the HBQ.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant interaction between time and treatment on efficacy ($F = 2.50$, $p = 0.0436 < .05$ with Huynh-Feldt adjustment). This analysis indicated that the time of

administration of the efficacy measure had a differential effect on the three treatment groups.

Although there were no significant differences at pretest, the group counseling participants' efficacy scores dropped significantly at posttest (from 91.53 to 88.40) and leveled off at follow-up (90.58). Those who received printed information and those who received individual health counseling remained constant at posttest; however, at follow-up time the printed information participants' scores decreased significantly (from 93.63 to 89.86) and the individual counseling participants' scores changed very little (from 95.61 to 94.14). Figure 4-2 presents a visual graph of the data.

Figure 4-2. Perceived efficacy means for three treatment groups: Printout (TX1), group counseling (TX2), and individual counseling (TX3).

HO3e: There is no interaction effect for efficacy between type of employee and time of administration of the efficacy measure of the HBQ.

The data support the rejection of null hypothesis HO3e. According to the results of the split-plot ANOVA, there was a significant interaction between time and employee type on efficacy ($F = 3.46$, $p = 0.0333 < .05$ with Huynh-Feldt

adjustment). This analysis indicated that the time of administration of the efficacy measure had a differential effect on the two employee types. At pretest time white-collar workers' scores (91.92) were approximately two points lower than blue-collar workers' scores (94.06). At posttest the white-collar scores increased to 93.56, while the blue-collar scores decreased to 91.20. By follow-up time, white-collar scores (90.45) had dropped below blue-collar scores (92.54). Figure 4-3 presents a visual graph of the data.

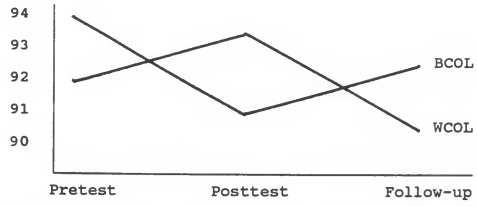

Figure 4-3. Perceived efficacy means for two employee types: Blue-collar (BCOL) and white-collar (WCOL).

HO3f: There is no interaction effect for efficacy between type of employee and type of treatment.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment type and employee type ($F = 0.12$, $p = 0.8835 > .05$).

HO3g: There is no interaction effect for efficacy between type of treatment, type of employee, and time of administration of the efficacy measure of the HBQ.

The data do support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant interaction between time and employee type and treatment method on efficacy ($F = 3.07$, $p = 0.0173 < .05$ with Huynh-Feldt adjustment). This analysis indicated that the time of administration of the efficacy measure had a differential effect on the two employee types, depending on the treatment group in which they participated.

Pretest scores clustered between 92.64 (WCOL, TX3) and 94.77 (WCOL, TX1) with one significantly lower score of 88.36 (WCOL, TX2). Both groups who received the printout remained stable at pretest but dropped significantly at follow-up. Both groups who received group counseling were in the low range at pretest and increased at follow-up. The individual health counseling had the opposite effect on white-collar employees than on blue-collar. White-collar scores increased six points at posttest (98.63) and then dropped more than seven points at follow-up (91.53); while blue-collar scores decreased two points at posttest (92.58) and then increased more than four points at follow-up (96.89). Figure 4-4 presents a visual graph of the data.

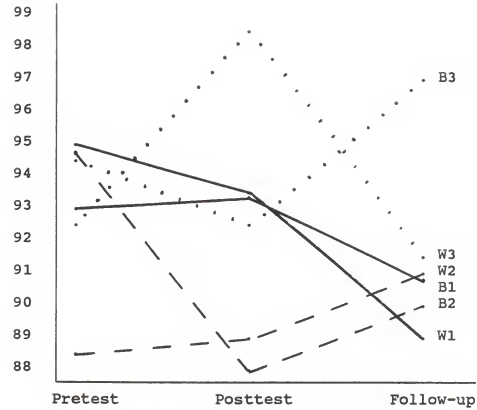

Figure 4-4. Perceived efficacy means for two employee types and three treatment Methods.

Notes: W1 = White-collar employees, printout (___)
B1 = Blue-collar employees, printout (___)
W2 = White-collar employees, group (---)
B2 = Blue-collar employees, group (---)
W3 = White-collar employees, individual (...)
B3 = Blue-collar employees, individual (...)

Health Beliefs Regarding Self-efficacy

To test the hypotheses related to health beliefs regarding perceived self-efficacy for performing preventive health behaviors a split-plot ANOVA was used. Self-efficacy was measured on three occasions. Table 4-7 shows the means for the self-efficacy scores at pretest, posttest, and

follow-up. The source table detailing the statistical tests of the split-plot ANOVA follows in Table 4-8.

Table 4-7.

Means for Self-efficacy.

Treatment Method	Time of Observation: Employee Type	N	Pretest	Posttest	Follow-up
Printout	White-Collar	22	97.86	99.18	101.30
	Blue-Collar	20	85.85	92.58	98.72
Group	White-Collar	22	99.55	107.29	106.63
	Blue-Collar	23	103.48	101.27	101.19
Individual	White-Collar	22	99.00	113.58	108.84
	Blue-Collar	20	90.00	104.95	102.94

Table 4-8.

Source Table of ANOVA of Self-efficacy.

Source	DF	SS	MS	F
Between Subjects				
COL	1	3442.87	3442.87	4.34*
TX	2	3139.46	1569.73	1.98
COL X TX	2	572.09	286.05	0.36
Error Between	109	86554.99	794.08	
Within Subjects				
TIME	2	3694.28	1847.14	9.03*
TIME X COL	2	168.92	84.46	0.41
TIME X TX	4	1873.04	468.26	2.29
TIMExTXxCOL	4	905.96	226.49	1.11
Error Within	218	44570.80	204.45	

*$p < .05$

HO4a: There is no significant difference in scores on the self-efficacy measure of the HBQ (when all self-efficacy scores for white- and blue-collar employees are combined and averaged across occasions) between the three treatment methods employed.

HO4a could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of treatment type on self-efficacy ($F = 1.98$, $p = 0.1434 > .05$).

HO4b: There is no significant difference in scores on the self-efficacy measure of the HBQ (when all self-efficacy scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

These data support the rejection of null hypothesis HO4b. According to the results of the split-plot ANOVA, there was a significant main effect of employee type on self-efficacy ($F = 4.34$, $p = 0.0397 < .05$.). This analysis indicated that there was a significant difference in self-efficacy scores between white-collar and blue-collar employees. At all three measurement occasions, white-collar employees' scores were at least 4.5 points greater than blue-collar employees' scores.

HO4c: There is no significant difference in scores on the self-efficacy measure of the HBQ for all employees

between the pretest, the posttest, and the follow-up measures.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant main effect of time on self-efficacy (F = 9.03, p = 0.0002 < .01 with Huynh-Feldt adjustment). This analysis indicated that there was a general trend to increase self-efficacy across measurement occasions for all subjects. The overall mean for self-efficacy was seven points greater at follow-up (103.26) than at pretest (96.26).

HO4d: There is no interaction effect for self-efficacy scores between treatment method and time of administration of the self-efficacy measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between time and treatment type (F = 2.29, p = 0.0607 > .05 with Huynh-Feldt adjustment).

HO4e: There is no interaction effect for self-efficacy between type of employee and time of administration of the self-efficacy measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between time and employee type (F = 0.41, p = 0.6621 > .05 with Huynh-Feldt adjustment).

HO4f: There is no interaction effect for self-efficacy between type of employee and type of treatment.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between employee type and treatment type ($F = 0.36$, $p = 0.6983 > .05$ with Huynh-Feldt adjustment).

HO4g: There is no interaction effect for self-efficacy between type of treatment, type of employee, and time of administration of the self-efficacy measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment method, employee type, and time ($F = 1.11$, $p = 0.3537 > .05$ with Huynh-Feldt adjustment).

Health Locus of Control

To test the hypotheses related to health locus of control a split-plot ANOVA was used. Health locus of control was measured on three occasions. Table 4-9 shows the means for the locus of control scores at pretest, posttest, and follow-up. The source table detailing the statistical tests of the split-plot ANOVA follows in Table 4-10.

Table 4-9.

Means for Multidimensional Health Locus of Control.

Treatment Method	Employee Type	N	Time of Observation Pretest	Posttest	Follow-up
Printout	White-Collar	22	73.50	70.77	71.45
	Blue-Collar	20	68.45	64.53	70.83
Group	White-Collar	22	71.91	72.14	72.32
	Blue-Collar	23	67.65	68.36	67.90
Individual	White-Collar	22	72.23	75.58	72.11
	Blue-Collar	20	70.00	69.05	67.17

Table 4-10.

Source Table of ANOVA of Multidimensional Health Locus of Control.

Source	DF	SS	MS	F
Between Subjects				
COL	1	1655.71	1655.71	13.59*
TX	2	132.91	66.46	0.55
COL X TX	2	1.37	0.68	0.01
Error Between	109	13275.61	121.79	
Within Subjects				
TIME	2	2.91	1.45	0.06
TIME X COL	2	74.31	37.15	1.57
TIME X TX	4	444.87	111.22	4.69*
TIMExTXxCOL	4	185.94	46.48	1.96
Error Within	218	5173.34	23.73	

*$p < .01$

HO5a: There is no significant difference in scores on the multidimensional health locus of control measure (when all the scores for white-and blue-collaremployees are combined and averaged across occasions) between the three treatment methods employed.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of treatment type on multidimensional health locus of control ($F = 0.55$, $p = 0.5810 > .05$).

HO5b: There is no significant difference in scores on the multidimensional health locus of control measure (when all multidimensional health locus of control scores for all three groups of white-collar or blue-collar employees are combined and averaged across occasions) between white-collar and blue-collar employees.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant main effect of employee type on health locus of control ($F = 13.59$, $p = 0.0004 < .01$). This analysis indicated that there was a significant difference in locus of control scores between white-collar and blue-collar employees. At all three measurement occasions, white-collar employees' scores (72.55, 72.71, 71.95) were several points

greater than blue-collar employees' scores (68.65, 67.37, 68.60).

HO5c: There is no significant difference in scores on the multidimensional health locus of control measure for all employees between pretest, posttest, and follow-up measures.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant main effect of time on health locus of control (F = 0.06, p = 0.9406 > .05 with Huynh-Feldt adjustment).

HO5d: There is no interaction effect for multidimensional health locus of control scores between treatment method and time of administration of the multidimensional health locus of control measure.

The data support the rejection of this null hypothesis. According to the results of the split-plot ANOVA, there was a significant interaction between time and treatment on health locus of control (F = 4.69, p = 0.0012 < .01 with Huynh-Feldt adjustment). This analysis indicated that the time of administration of the locus of control measure had a differential effect on the three treatment groups.

Follow-up analysis using the Dunn correction indicated significant differences pretest-posttest (F = 9.81) for locus of control scores of participants given the HRA printed feedback with no explanation or interpretation

(TX1). No significant differences were found for group counseling participants (TX2 F = 0.20) or individual counseling participants (TX3 F = 1.30). Figure 4-5 presents a visual graph of the data.

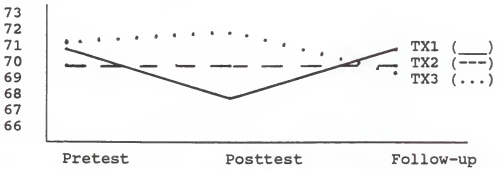

Figure 4-5. Multidimensional health locus of control means for three treatment types: Printout (TX1), group counseling (TX2), and individual counseling (TX3).

HO5e: There is no interaction effect for multidimensional health locus of control between type of employee and time of administration of the multidimensional health locus of control measure.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between time and employee type (F = 1.57, p = 0.2113 > .05. with Huynh-Feldt adjustment).

HO5f: There is no interaction effect for multidimensional health locus of control between type of employee and type of treatment.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between employee type and treatment type (F = 0.01, p = 0.9944 > .05).

H05g: There is no interaction effect for multidimensional health locus of control between type of treatment, type of employee, and time of administration of the multidimensional health locus of control measure of the HBQ.

This null hypothesis could not be rejected because according to the results of the split-plot ANOVA, there was no significant interaction between treatment type, employee type, and time ($F = 1.96$, $p = 0.1019 > .05$ with Huynh-Feldt adjustment).

Summary

Five sets of null hypotheses were tested using split-plot analysis of variance. The results of these data analyses indicated some statistically significant results for each of the dependent variables. There was a significant main effect of time on health age. Health age decreased (i.e., improved) for all groups. For the perceived susceptibility variable there was also a significant main effect of time as well as a significant interaction between time and employee type at posttest and follow-up. In general perceived susceptibility to disease increased at posttest. Although there were no significant differences between white-collar and blue-collar employees at pretest, blue-collar employees had significantly higher susceptibility scores at posttest and follow-up.

There were three significant interactions for the perceived efficacy variable: (a) time by employee type, (b) time by treatment type, and (c) time by employee type by treatment type. Treatment affected white-collar employees (whose efficacy scores increased at posttest and dropped at follow-up) differently than blue-collar employees (whose scores dropped at posttest and increased at follow-up). There was little difference in scores between treatment groups at pretest and posttest, but those who received individual counseling (TX3) scored significantly higher at follow-up. The three-way interaction indicated clusters of scores with the most significant differences between posttest and follow-up for the individual counseling (TX3) participants.

The analyses yielded significant main effects of time and employee type on self-efficacy. All groups increased self-efficacy over time, and white-collar employees were consistently higher on self-efficacy than blue-collar employees. For the health locus of control variable there was a significant main effect of employee type with white-collar employees scoring consistently higher on internal locus of control. There was also a significant interaction between time and treatment type which indicated the printout group dropped significantly in locus of control at pretest. The meaning of these results will be discussed in Chapter V.

CHAPTER 5

SUMMARY, DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The purpose of this study was to examine the effects of three treatment conditions on the health behaviors, health beliefs, and health locus of control of university employees classified as either white-collar or blue-collar. The personalized Health Risk Appraisal (HRA) printout was a method of communicating the risks of dying from disease or accident in the next ten years and making recommendations for changing personal health behaviors to reduce these risks. Study participants received this information through one of three treatment methods: (a) HRA printout without discussion or interpretation; (b) HRA printout interpreted and discussed in group counseling session; or (c) HRA printout interpreted and discussed in individual counseling session.

The Lindquist Type III True Experimental Design was used in this study. The results were analyzed using split-plot Analysis of Variance (ANOVA) to determine main effects of, and interactions between treatment types, employee types and time. Health behaviors, health beliefs, and health

locus of control were measured on three occasions: pretest, posttest, and eight-week follow-up.

A total of 129 University of Florida Physical Plant Division employees participated in the study. Stratified random sampling was used to select participants who were randomly assigned to treatment conditions. One hundred eighteen employees completed all three sessions of the study. All participation was voluntary.

Discussion of Results

The analysis of the data from this study yielded some significant results for each of the five variables tested, confirming some previous research findings and questioning others. Differences were noted among all six cells: (a) white-collar/printout; (b) blue-collar/printout; (c) white-collar/group counseling; (d) blue-collar/group counseling; (e) white-collar/individual counseling; and (f) blue-collar/individual counseling. These differences are discussed variable by variable in this chapter.

Health Age

According to the results of the data analysis, there was a significant main effect of time on health age. At pretest the overall mean for health age (as determined by the HRA) was 41.95 years. At follow-up time the overall mean for health age had decreased by more than one-half year

(0.53) to 41.42 years, bringing it more in line with the overall mean for chronological age (CA), 41.15 years.

Surprisingly, there were no significant differences between groups. It was expected that the white-collar employees in this study would have better health at the outset and would improve more during the study than their blue-collar counterparts. The white-collar employees health was better at pretest. At follow-up, however, the white-collar employees remained almost the same, while the blue-collar employees' health age improved considerably (from 1.56 > CA to only 0.88 > CA).

Health Beliefs Regarding Susceptibility

According to the results of the data analysis, there was a significant main effect of time on perceptions of susceptibility to disease and accident. There was also a significant interaction between time and employee type. The significant increase in the overall mean for perceived susceptibility occurred from pretest (23.22) to posttest (25.31) and was the result of a large increase in the susceptibility scores of the blue-collar employees (from 22.89 pretest to 27.35 posttest) which offset the decrease in white-collar scores (from 23.53 at pretest to 23.34 posttest).

In light of previous research (Hutchins, 1991; Janz & Becker, 1984; King, 1982; Maiman, 1977; Milsum, 1980) it was expected that the risk of dying of disease or accident as

communicated in the HRA printout would increase participants' perception of susceptibility to life-threatening conditions. This held true for the blue-collar employees whose risk of dying was considerably greater than that of the white-collar employees. The fact that high risk blue-collar employees viewed themselves as more susceptible while the low risk white-collar employees considered themselves less susceptible to dying supports Stiles' (1987) and Weinstein's (1982) findings that low-risk participants believe themselves to be less susceptible to disease/accident. Therefore, the HRA process had a direct effect on participants' perceived susceptibility to life-threatening conditions.

Health Beliefs Regarding Efficacy

Contrary to the original proponents of the Health Belief Model, previous studies (Cioffi, 1980; Faust, 1981; and Stiles, 1987) have found no significant effect of health risk appraisal counseling on perceived efficacy. The current study found differential effects among the various groups. According to the results of the data analysis concerning efficacy for preventing life-threatening conditions, there were three significant interaction effects: (a) between time and employee type; (b) between time and treatment method; and (c) between time, treatment method, and employee type.

The communication of the HRA information had a differential effect on white-collar and blue-collar employees' perceptions of efficacy for preventing life-threatening conditions. At posttest, immediately following the communication of HRA information, white-collar employees' efficacy scores increased (from 91.92 at pretest to 93.56), while blue-collar scores decreased (from 94.06 at pretest to 91.2). Perhaps because their HRA printout informed them they were basically healthy and pointed out strengths in their current health behavior, white-collar employees in this study believed personal health behavior could make a difference. The blue-collar employees, on the other hand, were less healthy and may have felt discouraged about the ability of individual behavior to prevent health problems. Because the HRA counseling session stressed changing health behaviors in order to increase life expectancy, and because the blue-collar employees had a greater need to do so, they may have felt powerless to do something about their own health.

By follow-up time white-collar scores (90.45) had decreased significantly, while blue-collar scores (92.54) increased. This could be due to the fact that the intervention consisted of only one health counseling session. Individual health behavior change was stressed at the intervention session. However, after eight weeks time

without further reinforcement, follow-up scores leveled off close to the pretest level.

There were significant differences in efficacy scores for the three treatments from posttest to follow-up. The efficacy scores of those who received printed information only remained stable at posttest (from 93.93 to 93.63), but dropped significantly at follow-up (89.87). Without the benefit of counseling, they may have felt powerless to improve health behavior. Individual counseling participants' scores (93.55, 95.61, 94.14) changed little throughout time. Those who received group counseling decreased their efficacy scores significantly from pretest (91.53) to posttest (88.40). Perhaps they felt discouraged by the HRA information. Another factor to be considered is group dynamics. The group sessions included participants teasing each other about unhealthy behaviors, as well as some defending of these personal behaviors. This may have contributed to the perception that they had little personal power to prevent health problems. Nevertheless, by follow-up time, their scores had returned to the pretest levels.

The interaction between time, treatment method, and employee type was quite complicated. Again, the treatment methods affected white-collar and blue-collar employees differently. Individual counseling was effective for raising efficacy scores for white-collar at posttest but reducing them at follow-up. However, counseling appeared to

lower blue-collar efficacy scores at posttest, but significantly raised them at follow-up. Perhaps the posttest scores were influenced by the fact that the white-collar group had the "best" health age (0.79 years < CA) and the blue-collar workers had the "worst" health age (2.73 years > CA). Group counseling effected a big decrease in blue-collar efficacy scores at posttest and an increase for both blue-collar and white-collar at follow-up. Both groups who received printed information only dropped significantly from posttest to follow-up. These results, therefore, seem to suggest that in order to sustain efficacy beliefs over time, counseling and follow-up activities are necessary.

Health Beliefs Regarding Self-efficacy

According to the results of the data analysis, there was a significant main effect of employee type on perceptions of self-efficacy. In addition there was a significant main effect of time on self-efficacy. Considering previous research on self-efficacy (Bandura 1982, 1986; Goldfreid & Robins, 1982; and Marlatt & Gordon, 1985), it is not surprising that white-collar employees in this study ranked higher on self-efficacy over time than did blue-collar employees. The white-collar group consisted of professionals, office workers, and supervisors. This group included many people in power positions. Their self-efficacy has been enhanced due to their education, economic and social status, and a higher degree of control over

personal environment than their blue-collar counterparts, many of whom have been placed in powerless positions where their belief in their ability to control their own environment has been stifled.

The general trend to increase self-efficacy over time is supported by Bandura's (1986) theory that self-efficacy can be taught through personal experience, role modeling, social pressure, and somatic arousal. In this study participants were given information (HRA) not only about risk of dying, but also about positive health behaviors which they had already incorporated into their lives. They were counseled about their own responsibility for effecting healthy changes in their lives, and they were encouraged to make a personal commitment to improvement. This increase in self-efficacy appears to be directly related to the positive outcome, decrease in health risk age, of the participants in this study.

Health Locus of Control

According to the results of the data analysis, there was a significant main effect of employee type on health locus of control. Further, there was a significant interaction between time and treatment type. Because this variable is related to self-efficacy, it is not surprising that white-collar employees' locus of control scores (internal dimension) were significantly higher than blue-collar employees' scores across all occasions in this study.

Again, the degree of control they have over their environments is directly related to perceptions of their ability to effect change. Blue-collar workers, who have little power in the workplace or in society, are likely to feel like victims of circumstance controlled by outside forces and chance. In working with blue-collar groups it would probably be advisable to train participants for "internality" (Wallston & Wallston, 1978). This study did that to some extent (counseling sessions) by teaching participants that their behavior does make a difference and encouraging them to decide to make positive health behavior changes.

Regarding the interaction between time and treatment type, giving printed information only had an immediate detrimental effect on health locus of control. While the counseling groups' scores did not change significantly, the printout group's locus of control dropped significantly at posttest. This could be due to the fact that the "bad news" contained in the HRA printout was not tempered by the counseling session which informed participants that over one-half of their health (risk of dying) is within their own control through healthy behaviors. Also, it was not suggested to this group, as it was to others, that they could begin by making a decision to change one health behavior starting now. Therefore, it seems advisable that

to help participants take more control over their own health behaviors, counseling is essential to the HRA process.

Implications

Considering the results of this study, a number of implications are suggested. These implications apply to health counseling theory, research, training, and practice.

The differences among groups in this study appear to support the theoretical base upon which the study was designed. The application of social learning theory (Bandura, 1977a, 1982, 1986), including information, modeling, and skill development mediated by self-referent thought, to health promotion strategies apparently helped to affect positive changes in the health behavior of the participants in this study. Although those who received printed information only did make slight improvements in their health age, the groups who attended a health counseling session, which included further information, modeling, and skill development made more positive health behavior changes. In addition, the obvious differences between the white-collar and blue-collar employees in this study regarding self-efficacy and health locus of control support the theories upon which the Health Belief Model (Maiman & Becker, 1974) and locus of control (Rotter, 1966; Wallston, Wallston, & DeVellis, 1978) are based. Therefore, these theories can be refined and applied differentially to specific groups.

In this study there were differences between white- and blue-collar university employees and between the three treatment methods. Future research should examine different population groups in other work settings. Other factors to be considered include gender, socioeconomic status (defined more specifically than white-collar or blue-collar), and race-ethnicity. Much still remains to be learned about which interventions work best for which groups under which conditions.

Counselor training programs, especially those emphasizing health counseling, should sensitize counselors-in-training to the differences among work groups. Trainees should be encouraged to develop psychoeducational interventions specific to the individual needs of the groups being served. The effectiveness as well as the limitations of individual vs. group counseling techniques should be stressed. Further, multicultural counseling techniques must be emphasized if health counseling is to be effective for a wide range of participants.

Information gained from this study could be applied by counseling practitioners in worksite health promotion/ wellness settings. Based on the results of this study, practitioners should approach white-collar employees differently than blue-collar employees. They should attempt to offer more than one health counseling session, to schedule follow-up sessions sooner, and to choose group or

individual sessions depending on the type of employees being served.

Recommendations for Further Study

This study supported some previous research findings, and points the way for further research to be done. Although the interactions were in some cases complex, some recommendations emerged.

1. The foremost fact emerging from this study is that different approaches are in order for white-collar and blue-collar university employees. On all dimensions, other than health age, there were significant differences between employee types at some time during the study.

2. On some dimensions (susceptibility, self-efficacy, locus of control) some groups' scores tended to level off at follow-up time. This seems to indicate two remedial actions: (a) follow-up should be done sooner; and (b) more than one counseling session should be offered in order to reinforce new concepts and encourage participants to stick to their resolve to improve health.

3. The current study should be replicated in other work settings to evaluate the consistency of differences among white- and blue-collar employees.

4. Continued research and health promoting activities need to be made available to all population groups, not just the elite. The enthusiasm and cooperativeness of participants of all groups in this study indicate a need and

a willingness on the part of the working population to focus attention on health. The workplace can continue to make a valuable contribution to the overall health of this country's population.

APPENDIX A

INFORMED CONSENT FORM

Participant's Name_____

Code#_____

Research Title: Health Risk Appraisal Counseling: Effect on Employee Health Behaviors, Health Beliefs, and Health Locus of Control

Principal Investigator: Sheri A. Wallace, Ph.D. Candidate
Counselor Education Department
University of Florida

The purpose of this research is to compare the effectiveness of three methods of communicating health information to employees. The information collected will be used to enhance employee health and determine the direction for future employee health promotion programs.

Participation in this research project involves:

1. Participating in an interview in which three questionnaires regarding your health behaviors and health beliefs will be completed.

2. Attending a health counseling session where you will be asked to answer questions regarding health beliefs.

3. Participating in a follow-up interview (three months later) in which three questionnaires regarding your health behaviors and health beliefs will be completed.

4. Step one and step three include actual measures of height, weight, blood pressure. If any health problems are revealed, you will be referred to your primary physician for evaluation and/or care.

To protect your confidentiality, code numbers will be used to identify participants. A control card with your code number, name, and work station will be filed separately from your questionnaires. This information will be used only to notify you of follow-up meetings and will be destroyed upon completion of this research study. The names of those who participate in the study will not be used in any report. Only group data will be communicated to the employer. No risks to the participants in this study are anticipated.

My signature below indicates that:

1. The nature and purpose of this research, has been explained to me; and I have been given the opportunity to ask any questions regarding my participation.

2. I understand that this investigation may be used for educational purposes which may include publication; however, confidentiality will be protected.

3. I understand that participation in this research study is voluntary and that I may withdraw my consent at any time.

4. The procedure described above has been explained to me. I agree to participate in the procedure described and I have received a copy of this description.

Signed:_____ Date:_____

I have defined and explained fully this research to the participant whose signature appears above.

Signed_____ Date:_____

APPENDIX B

HEALTH BELIEF QUESTIONNAIRE--SECTION I

Choose the answer that best expresses your response to each of the questions asked. Answer "1" if you think the best answer is "no chance;" "2" if it is "a slight chance;" "3" if it is "a moderate chance" (50-50); "4" if it is "a good chance;" and "5" if the best answer is "a very good chance."

1. In the next 10 years, how much chance do you think there is that y could ever get the following conditions?	No chance	A slight chance	A moderate chance	A good chance	A very good chance
a. heart disease	1	2	3	4	5
b. a stroke	1	2	3	4	5
c. high blood pressure	1	2	3	4	5
d. lung cancer	1	2	3	4	5
e. alcoholism	1	2	3	4	5
f. serious emotional problems	1	2	3	4	5
g. pneumonia	1	2	3	4	5
h. cancer of the colon	1	2	3	4	5
i. AIDS	1	2	3	4	5
For women only:					
i. breast cancer	1	2	3	4	5
j. cervical cancer	1	2	3	4	5
2. In the next 10 years how much chance do you think there is that you could be involved in a motor vehicle accident?	1	2	3	4	5

3. How easily would you say that you get sick?	Not at all 1	Slightly 2	Moderately 3	Easily 4	Very Easily 5
4. How easily would you say that you get involved in motor vehicle accidents?	1	2	3	4	5
5. Many people believe that there are things they can do to prevent health problems. How much do you think people can do for themselves to prevent the following health problems?	Nothing				A Great Deal
a. heart disease	1	2	3	4	5
b. a stroke	1	2	3	4	5
c. high blood pressure	1	2	3	4	5
d. lung cancer	1	2	3	4	5
e. alcoholism	1	2	3	4	5
f. serious emotional problems	1	2	3	4	5
g. pneumonia	1	2	3	4	5
h. cancer of the colon	1	2	3	4	5
For women only:					
i. breast cancer	1	2	3	4	5
j. cervical cancer	1	2	3	4	5
6. How much do you think people can do for themthemselves to prevent a motor vehicle accident?	1	2	3	4	5

7. How much do you believe each of the following actions can prevent serious health problems?	Would do nothing at all to prevent				Would completely prevent
a. regular checkups	1	2	3	4	5
b. having special medical tests done	1	2	3	4	5
c. keeping weight in the normal range	1	2	3	4	5
d. not drinking much	1	2	3	4	5
e. getting enough sleep and rest	1	2	3	4	5
f. not smoking	1	2	3	4	5
g. eating special food	1	2	3	4	5
h. taking vitamins	1	2	3	4	5
i. regular planned exercise	1	2	3	4	5
j. controlling anxiety and tension	1	2	3	4	5

8. Many people think that there are things they can do to prevent serious motor vehicle accidents.

How much do you believe each of the following actions can prevent serious motor vehicle accident injuries?

a. using a seat belt 75 to 100% of the time	1	2	3	4	5
b. observing the speed limit	1	2	3	4	5
c. not driving after drinking	1	2	3	4	5
d. not driving when tired or drowsy	1	2	3	4	5
e. keeping the car in good condition	1	2	3	4	5

HEALTH BELIEFS QUESTIONNAIRE--SECTION II

First, indicate which health behaviors you believe you will be able to perform during the next six months. Second, for each of these behaviors, indicate the degree of certainty, from 1 (very uncertain) to 10 (very certain) that you can perform that behavior.

HEALTH BEHAVIOR	ABLE TO PERFORM	DEGREE OF CERTAINTY
1. Stay within 10 lbs. recommended wt.	___	10 20 30 40 50 60 70 80 90 100
2. Eat breakfast 6-7 days per week	___	10 20 30 40 50 60 70 80 90 100
3. Avoid smoking cigarettes	___	10 20 30 40 50 60 70 80 90 100
4. Sleep 7-8 hours per night	___	10 20 30 40 50 60 70 80 90 100
5. Exercise at least 3 times per week	___	10 20 30 40 50 60 70 80 90 100
6. Drink no more than 2 caffienated drinks per day	___	10 20 30 40 50 60 70 80 90 100
7. Wear a seat belt while driving or riding in a car	___	10 20 30 40 50 60 70 80 90 100
8. Avoid driving or riding with someone under the influence of alcohol	___	10 20 30 40 50 60 70 80 90 100
9. Drink no more than one alcoholic drink per day	___	10 20 30 40 50 60 70 80 90 100
10. Practice personal tension control skills	___	10 20 30 40 50 60 70 80 90 100
11. Avoid use of unnecessary or recreational (street) drugs	___	10 20 30 40 50 60 70 80 90 100
12. Do a Breast (F) or Testicular (M) self-exam monthly	___	10 20 30 40 50 60 70 80 90 100
13. Avoid foods high in saturated fat.	___	10 20 30 40 50 60 70 80 90 100
14. Practice safe sex	___	10 20 30 40 50 60 70 80 90 100

APPENDIX C

MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL (MHLC) SCALES

Please listen to these general health statements and indicate your level of agreement or disagreement.

1 = Strongly Disagree (SD)
2 = Disagree (D)
3 = Somewhat Disagree (SWD)
4 = Somewhat Agree(SWA)
5 = Agree (A)
6 = Strongly Agree (SA)

STATEMENTS

1. If you get sick, you have the power to make yourself well again.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
2. You often feel that no matter what you do, if you're going to get sick, you'll get sick.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
3. If you see an excellent doctor regularly, you are less likely to have health problems.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
4. It seems that your health is greatly influenced by accidental happenings.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
5. You can only maintain your health by consulting professionals.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
6. You are directly responsible for your own health.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
7. Other people play a big part in whether you stay healthy or become sick.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6
8. Whatever goes wrong with your health is your own fault.	SD 1	D 2	SWD 3	SWA 4	A 5	SA 6

9. When you get sick, you just have to let nature take its course.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
10. Health professionals keep you healthy.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
11. When you stay healthy, you are just plain lucky.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
12. Your physical well-being depends on how well you take care of yourself.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
13. When you feel ill, you know it's because you have not been taking care of yourself.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
14. The type of care you receive from other people is what is responsible for how well you recover from an illness.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
15. Even when you take care of yourself, it's easy to get sick.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
16. When you become ill, it's a matter of fate.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
17. You can pretty much stay healthy by taking good care of yourself.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6
18. Following doctor's orders to the letter is the best way for you to stay healthy.	SD	D	SWD	SWA	A	SA
	1	2	3	4	5	6

APPENDIX D

HEALTH RISK APPRAISAL

Health Risk Appraisal is an educational tool. It shows you choices you can make to keep good health and avoid the most common causes of death for a person your age and sex. This Health Risk Appraisal is not a substitute for a check-up or physical exam that you get from a doctor or nurse. It only gives you some ideas for lowering your risk of getting sick or injured in the future. It is NOT designed for people who already have HEART DISEASE, CANCER, KIDNEY DISEASE, OR OTHER SERIOUS CONDITIONS. If you have any of these problems and you want a Health Risk Appraisal anyway, ask your doctor or nurse to read the report with you.

DIRECTIONS: To keep your answers confidential DO NOT write your name or any identification on this form. Please keep the coupon with your participant number on it. You will need it to claim your computer report. To get the most accurate results answer as many questions as you can and as best you can. If you do not know the answer leave it blank. Questions with a ✻ (star symbol) are important to your health, but are not used by the computer to calculate your risks. However, your answers may be helpful in planning your health and fitness program.

Please put your answers in the empty boxes. (Examples: 0 or 125)

1. SEX		1 ☐ Male 2 ☐ Female
2. AGE		☐☐ Years
3. HEIGHT	(Without shoes) (No fractions)	☐ Feet ☐☐ Inches
4. WEIGHT	(Without shoes) (No fractions)	☐☐☐ Pounds
5. Body frame size		1 ☐ Small 2 ☐ Medium 3 ☐ Large
6. Have you ever been told that you have diabetes (or sugar diabetes)?		1 ☐ Yes 2 ☐ No
7. Are you now taking medicine for high blood pressure?		1 ☐ Yes 2 ☐ No
8. What is your blood pressure now?		☐☐☐ / ☐☐☐ Systolic (High number) / Diastolic (Low number)
9. If you *do not* know the numbers, check the box that describes your blood pressure.		1 ☐ High 2 ☐ Normal or Low 3 ☐ Don't Know
10. What is your TOTAL cholesterol level (based on a blood test)?		☐☐☐ mg/dl
11. What is your HDL cholesterol (based on a blood test)?		☐☐☐ mg/dl
12. How many cigars do you usually smoke per day?		☐☐ cigars per day
13. How many pipes of tobacco do you usually smoke per day?		☐☐ pipes per day
14. How many times per day do you usually use smokeless tobacco? (Chewing tobacco, snuff, pouches, etc.)		☐☐ times per day

15. CIGARETTE SMOKING
How would you describe your cigarette smoking habits?

1 ☐ Never smoked ☛ Go to 18
2 ☐ Used to smoke ☛ Go to 17
3 ☐ Still smoke ☛ Go to 16

16. STILL SMOKE
How many cigarettes a day do you smoke? ☛ GO TO QUESTION 18

☐ cigarettes per day ☛ Go to 18

17. USED TO SMOKE
a. How many years has it been since you smoked cigarettes fairly regularly?

☐ years

b. What was the average number of cigarettes per day that you smoked in the 2 years before you quit?

☐ cigarettes per day

18. In the next 12 months how many thousands of miles will you probably travel by each of the following? (NOTE: U.S. average = 10,000 miles)
a. Car, truck, or van: ☐,000 miles
b. Motorcycle: ☐,000 miles

19. On a typical day how do you USUALLY travel? (Check one only)

1 ☐ Walk
2 ☐ Bicycle
3 ☐ Motorcycle
4 ☐ Sub-compact or compact car
5 ☐ Mid-size or full-size car
6 ☐ Truck or van
7 ☐ Bus, subway, or train
8 ☐ Mostly stay home

20. What percent of the time do you usually buckle your safety belt when driving or riding?

☐ %

21. On the average, how close to the speed limit do you usually drive?

1 ☐ Within 5 mph of limit
2 ☐ 6-10 mph over limit
3 ☐ 11-15 mph over limit
4 ☐ More than 15 mph over limit

22. How many times in the last month did you drive or ride when the driver had perhaps too much alcohol to drink?

☐ times last month

23. How many drinks of alcoholic beverages do you have in a typical week?

(Write the number of each type of drink)
☐ Bottles or cans of beer
☐ Glasses of wine
☐ Wine coolers
☐ Mixed drinks or shots of liquor

☛ *(MEN GO TO QUESTION 33)*

WOMEN

24. At what age did you have your first menstrual period?

☐ years old

25. How old were you when your first child was born?

☐ years old
(If no children write 0)

26. How long has it been since your last breast x-ray (mammogram)?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
27. How many women in your natural family (mother and sisters only) have had breast cancer?	☐ women
28. Have you had a hysterectomy operation?	1 ☐ Yes 2 ☐ No 3 ☐ Not sure
29. How long has it been since you had a pap smear test?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 30. How often do you examine your breasts for lumps?	1 ☐ Monthly 2 ☐ Once every few months 3 ☐ Rarely or never
★ 31. About how long has it been since you had your breasts examined by a physician or nurse?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 32. About how long has it been since you had a rectal exam? *(WOMEN GO TO QUESTION 34)*	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
MEN ★ 33. About how long has it been since you had a rectal or prostate exam?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 34. How many times in the last year did you witness or become involved in a violent fight or attack where there was a good chance of a serious injury to someone?	1 ☐ 4 or more times 2 ☐ 2 or 3 times 3 ☐ 1 time or never 4 ☐ Not sure
★ 35. Considering your age, how would you describe your overall physical health?	1 ☐ Excellent 2 ☐ Good 3 ☐ Fair 4 ☐ Poor
★ 36. In an average week, how many times do you engage in physical activity (exercise or work which lasts at least 20 minutes without stopping and which is hard enough to make you breathe heavier and your heart beat faster)?	1 ☐ Less than 1 time per week 2 ☐ 1 or 2 times per week 3 ☐ At least 3 times per week
★ 37. If you ride a motorcycle or all-terrain vehicle (ATV) what percent of the time do you wear a helmet?	1 ☐ 75% to 100% 2 ☐ 25% to 74% 3 ☐ Less than 25% 4 ☐ Does not apply to me

★ 38. Do you eat some food every day that is high in fiber, such as whole grain bread, cereal, fresh fruits or vegetables?	1 ☐ Yes 2 ☐ No
★ 39. Do you eat foods every day that are high in cholesterol or fat, such as fatty meat, cheese, fried foods, or eggs?	1 ☐ Yes 2 ☐ No
★ 40. In general, how satisfied are you with your life?	1 ☐ Mostly satisfied 2 ☐ Partly satisfied 3 ☐ Not satisfied
★ 41. Have you suffered a personal loss or misfortune in the past year that had a serious impact on your life? (For example, a job loss, disability, separation, jail term, or the death of someone close to you.)	1 ☐ Yes, 1 serious loss or misfortune 2 ☐ Yes, 2 or more 3 ☐ No
★ 42a. Race	1 ☐ Aleutian, Alaska native, Eskimo or American Indian 2 ☐ Asian 3 ☐ Black 4 ☐ Pacific Islander 5 ☐ White 6 ☐ Other 7 ☐ Don't know
★ 42b. Are you of Hispanic origin such as Mexican-American, Puerto Rican, or Cuban?	1 ☐ Yes 2 ☐ No
★ 43. What is the highest grade you completed in school?	1 ☐ Grade school or less 2 ☐ Some high school 3 ☐ High school graduate 4 ☐ Some college 5 ☐ College graduate 6 ☐ Post graduate or professional degree
★ 44. What is your job or occupation? (Check only one)	1 ☐ Health professional 2 ☐ Manager, educator, professional 3 ☐ Technical, sales or administrative support 4 ☐ Operator, fabricator, laborer 5 ☐ Student 6 ☐ Retired 7 ☐ Homemaker 8 ☐ Service 9 ☐ Skilled crafts 10 ☐ Unemployed 11 ☐ Other
★ 45. In what industry do you work (or did you last work)? (Check only one)	1 ☐ Electric, gas, sanitation 2 ☐ Transportation, communication 3 ☐ Agriculture, forestry, fishing 4 ☐ Wholesale or retail trade 5 ☐ Financial and service industries 6 ☐ Mining 7 ☐ Government 8 ☐ Manufacturing 9 ☐ Construction 10 ☐ Other

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BIOGRAPHICAL SKETCH

Sheri Anne Wallace was born to Eileen and Thomas Wallace on September 17, 1949 in Chicago, Illinois. In 1967 she graduated from the Academy of Our Lady High School, Chicago, Illinois. She attended Chicago State University where she graduated with high honors in 1972, receiving the Bachelor of Arts degree in education. She then began her teaching career at Calumet School in Calumet Park, Illinois.

During this time, Sheri married and eventually became the mother of four children: Brian (1972), Jim (1976), Sheila (1978), and Mindy (1981). She attended graduate school at Governors State University, University Park, Illinois, where she received the Master of Arts degree in counseling in 1984. Later that year Sheri became a National Certified Counselor. She then took the position of senior consultant at the Tri-City Comprehensive Community Mental Health Center, East Chicago, Indiana. In this capacity she consulted with and conducted prevention programs for various community organizations. She also co-authored a publication for the Indiana State Board of Health, Developing a Mobile Library for the Prevention of Sexual Assault.

In 1986 Sheri moved to Gainesville to attend the University of Florida, where she enrolled in the doctoral

program in counselor education. While she earned her degree, she held a graduate assistantship in the Division of Sponsored Research, where she edited the 1989 edition of DSR Graduate and Postdoctoral Support. She also held teaching assistantships for several courses including "Sex Roles in Modern Society," "Career and Lifespan Planning," and "Interpersonal Communication." In 1989 she received conference fellowships from the National Wellness Association and from Chi Sigma Iota International.

Throughout her graduate school career, Sheri has held various professional positions including Substance Abuse Counselor and Evaluation Counselor at Vista Pavilion, Instructor of Career Development at Santa Fe Community College, and Psychological Specialist at Tacachale. She also served as a therapist for the Sexual Assault Recovery Service on campus and the Early Enrichment/Family Support program at Mental Health Service. In 1990 she co-authored a book, Becoming a Professional Counselor: Preparing for National Counselor Certification and Comprehensive Exams.

Currently, Sheri is employed as a counselor supervisor at the Gainesville Drug Treatment Center, a facility of the Florida Department of Corrections. In the future she hopes to teach and conduct research in the field of mental health counseling, focusing on prevention and health promotion.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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